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MENT OPERATIONS.

Health research and training; hearings.

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# HEALTH RESEARCH AND TRAINING

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HEARINGS,  
BEFORE A  
SUBCOMMITTEE OF THE  
COMMITTEE ON  
GOVERNMENT OPERATIONS  
HOUSE OF REPRESENTATIVES  
EIGHTY-SEVENTH CONGRESS  
FIRST SESSION

---

AUGUST 1 AND 2, 1961

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Printed for the use of the  
Committee on Government Operations



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## HEALTH RESEARCH AND TRAINING

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TUESDAY, AUGUST 1, 1961

HOUSE OF REPRESENTATIVES,  
INTERGOVERNMENTAL RELATIONS SUBCOMMITTEE  
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,  
*Washington, D.C.*

The subcommittee met, pursuant to call, at 10:05 a.m., in room 100-B, George Washington Inn, Hon. L. H. Fountain (chairman of the subcommittee) presiding.

Present: Representatives L. H. Fountain, Neal Smith, Florence P. Dwyer, and Odin Langen.

Also present: Dr. D. C. Goldberg, professional staff member and James R. Naughton, counsel.

Mr. FOUNTAIN. A quorum being present for the purpose of taking testimony, let the subcommittee come to order.

The purpose of our hearing today is to receive information on the steps which have been taken, or are being considered, by the National Institutes of Health in response to the recommendations and suggestions made by the Committee on Government Operations in House Report No. 321, entitled "Health Research and Training: The Administration of Grants and Awards by the National Institutes of Health." That report was based on an intensive study conducted by this subcommittee.

We are pleased to have with us this morning, Dr. Terry, the Surgeon General of the Public Health Service, and Dr. Shannon, the Director of the National Institutes of Health. It is my understanding that Dr. Terry has a rather tight schedule this morning. Accordingly, we will be pleased to hear from him as our first witness so that he might keep his other commitments.

Before doing so, you might want to introduce the persons accompanying you here this morning, other than those I have already mentioned.

### STATEMENT OF DR. LUTHER L. TERRY, SURGEON GENERAL, PUBLIC HEALTH SERVICE

Dr. TERRY. You mentioned Dr. Shannon, who is on my immediate left, and who is Director of the National Institutes of Health. And on his left, Dr. Price, who is the Deputy Director of the National Institutes of Health; and Mr. Joseph Murtaugh, Chief of the Office of Program Planning of the National Institutes of Health.

Mr. FOUNTAIN. We are delighted to have all of you with us and we appreciate your presence here.

I believe you have a prepared statement, Dr. Terry, which we will be glad to hear at this time.

Dr. TERRY. Mr. Chairman and members of the committee, I am glad to have this opportunity to appear before this committee to discuss some of the policy and administrative problems of the Public Health Service. The effective and efficient operation of the Service is, of course, one of the prime responsibilities of my office and one of my major personal concerns.

The review of an important part of its many-sided operations contained in the second report by the Committee on Government Operations is therefore of great value to me. I very much appreciate the interest which the members of this subcommittee and you, Mr. Chairman, have taken in our grant operations and I am deeply grateful to your professional staff for the painstaking and careful manner in which the inquiry was conducted.

Relationships with non-Federal organizations, to which the committee report is, for the most part, devoted, are of particular importance to the Public Health Service because the philosophy underlying all its activities is that the improvement of health must be a cooperative enterprise and that its programs are best conducted in partnership with others. Consequently, a high proportion of the Service's activities involves collaboration with, and support for non-Federal bodies.

For many years the Service has worked closely with State and local governments, hospitals, educational institutions, and private organizations on a wide range of problems affecting the Nation's health. It is essential to the success of such joint endeavors that these relationships be fairly, smoothly and efficiently managed. The Service—and especially my office—is constantly striving to insure that this is the case.

The activities of the Public Health Service have grown in variety, complexity, and—especially during the past few years—in volume and in scope. This growth has naturally been accompanied by many new administrative problems.

Although the Public Health Service activities are constantly under review, there is a tendency for long-established systems and procedures to appear adequate to those most familiar with them even when they may no longer meet all of the new requirements imposed upon them by the growth or the changed character of the programs they serve. A critical review by an objective outside group is therefore of great assistance in calling attention to slowly growing but as yet unobserved administrative deficiencies.

It is in this light in which I view and warmly welcome the report's comments on the administration of the NIH grant and award programs. The intelligent examination of recent practices and the thoughtful recommendations for their improvement are very helpful in focusing attention on problem areas and suggesting the need for revised procedures.

I want to assure the committee that each criticism is being most carefully examined and each recommendation most seriously considered both in my office, by the Director of the NIH, and by those immediately responsible for the grant administration at NIH.



As the report is primarily concerned with NIH programs and the recommendations are mainly directed toward its administrative policies and practices, I should like to have Dr. Shannon and members of his staff discuss the specific points raised and describe to the committee what has already been done to rectify or modify procedures.

I should, however, like to address myself to one of the recommendations which is not directed to NIH and which, in any case, concerns a problem that lies outside the present scope of NIH programs. I refer to the recommendation that particular attention be given to the problem of attracting outstanding students to the field of medicine.

Although the Public Health Service has no formal responsibility for broad educational problems, it cannot discharge its obligation to protect and improve the Nation's health without concerning itself very deeply with the adequacy of our health manpower resources. The Service has three major areas of responsibility—the promotion of sound and effective public health practices, the provision of medical and hospital services, and the conduct and support of research. The effectiveness of our programs in each of these areas depends almost entirely on the availability of well-trained and highly capable professional and technical people. The impending shortage of well-qualified physicians is therefore a problem with which the Public Health Service is very much concerned.

We need more physicians for three simple and obvious reasons: our population is growing at a steady and fairly rapid rate; the proportion of older people, who usually require more medical care, is increasing and will continue to increase—partly as the result of medical research achievements; and our people will progressively demand more comprehensive medical care as general social and economic levels continue to rise and the ability of the medical profession to help them continues to expand.

The report prepared for my predecessor by the consultant group under the chairmanship of Mr. Frank Bane estimates—on the basis of population growth alone—that by 1970 we shall need 50,000 more physicians than we have now. In other words, we must, during the next 8 years, increase by at least 50 percent the number of young people attracted into the medical profession.

In the production of physicians—and of other health personnel—quality is as important as quantity. In fact, considering the awesome decisions which a physician is frequently forced to make, I should say more important—lives so often depend on the perceptiveness of a diagnosis, the skill with which a surgical procedure is carried out, or the foresight with which a course of treatment is designed.

The problem of attracting outstanding students to the field of medicine is indeed a serious one. I think, Mr. Chairman, that the recommendations of this committee on this point is extremely important to the welfare of our people. I very much hope that the appropriate executive agencies and committees of Congress will promptly heed your advice to give the problem their particular attention.

A matter which concerns me is the danger that the steps we must take to expand our supply of physicians will result in a further drop in quality. We cannot recruit students for the 20 additional medical schools which are proposed and increase enrollment in the existing schools and, at the same time, maintain or improve our standards

unless more outstanding students can be persuaded to select medicine as a career.

The decline in the appeal of a medical career is due to a number of factors of which the glamor of the physical sciences in the nuclear and space age is certainly one. Linked to this are the excellent job opportunities, at substantial starting salaries, now open to the physical scientist and the rise in social acceptability of science careers.

Twenty years ago an M.D. degree was regarded as a unique passport to social and economic standing in the community but this is no longer true. This is not entirely due to the competition of the other sciences; however, the general rise in income levels has done much to displace the doctor and lawyer from their preeminent position as leaders of their community.

A much more potent deterrent to the selection of a medical career is the duration of a medical education. Four years of postbaccalaureate study plus 3 years of unremunerative hospital training do not compare favorably with the road to a Ph. D.—or with the business opportunities open to a bright young man. Moreover, the fact that the fledgling doctor must wait until he is almost 30 years old before he can really start to earn a living is unacceptable to many young men in an era in which the pendulum has once again swung to early marriage and early parenthood.

Even if a young man or woman is willing to devote 7 postcollege years to becoming a physician, he or she may well be put off by the rigors of the course. I am sure that I am not voicing a personal prejudice when I say that medical school, internship, and residency are more grueling and make more sweeping demands on the student's time and energy than the studies and research work to which a Ph. D. candidate must discipline himself.

It is against this background that one must view the lack of financial support available to medical students. The members of this committee are, I know, aware of the invidious position in which the medical schools find themselves in competing with the graduate schools of our universities—and frequently of the same university with which the medical school is affiliated—for the bright graduates of the colleges and university undergraduate departments. A physics, chemistry, or biology major with good academic credentials seeking a Ph. D. degree has little or no trouble in getting a fellowship or other stipend which will cover both his educational and living expenses—often with additional allowances for a wife and children—while the same individual wishing to become a physician must have access to about \$11,000 to cover his medical school costs and can then look forward to 3 years of penury as an intern and resident.

In the circumstances, I marvel that the number of applicants for admission to medical school has not fallen more sharply and that so many bright young people with more attractive offers open to them are still to be found among them.

This is the measure of the problem of attracting outstanding students to the field of medicine. It seems to me, Mr. Chairman, that an essential step toward its solution must clearly be a comprehensive scholarship program for medical students which must, I think, ultimately be extended—or supplemented by a separate program—to cover internship and residency. This, as I have indicated, may not

entirely solve the problem but it is the step without which no solution is possible.

This is not only my personal view, it is the position of the Public Health Service, it is the position taken by Secretary Ribicoff, and it is an essential feature of the President's health program. It seems to me, Mr. Chairman, that the enactment by the Congress of the proposed Health Professions and Educational Assistance Act, which was introduced in the House as H.R. 4999, would go a long way toward ameliorating the problem about which the committee is concerned.

As I have already said, I think it will be more helpful to the committee if Dr. Shannon be allowed to speak to the other recommendations which concern the Public Health Service. They fall into his area of responsibility, and he will be able to comment more fully than I should be able to do both on the background of the problems and on the steps being taken to deal with them. I shall, of course, be glad to answer any questions or comment on any points which you, Mr. Chairman, or other members of the committee may wish to raise.

I have, as I am sure you know, a deep personal interest in the programs administered by the NIH with many of which I have been personally associated. I am proud—in fact, the whole Public Health Service is proud—of the outstanding scientific work which has been and continues to be done at NIH and of the vital role its extramural programs are playing in the advancement of medical research and in enhancing the ability of this country to give its citizens the best health care in the world.

The effectiveness of NIH is in no small measure due to Dr. Shannon's foresight and vigorous leadership. I know that he is as anxious as I am that both the substantive content and the administration of these programs be constantly improved. We are therefore more than willing to explore in depth and give the most serious thought to constructive recommendations such as this committee has put forward.

This, Mr. Chairman, concludes my prepared statement and I, of course, will be happy to answer any questions.

Mr. FOUNTAIN. Thank you, Dr. Terry.

In our observations and recommendations we did not suggest how more students might be attracted to the field of medicine. However, in recommending that attention be given to the problem of attracting outstanding students to the field of medicine, our committee was struck by the evidence presented by the Bane group, to which you have referred, and also by the apparent inconsistency in Federal policy of offering fellowship support for Ph. D. programs in the health fields but not for medical studies. It was our feeling that this policy, certainly to some extent, must deter some good students from the field of medicine. What is your feeling about that?

Dr. TERRY. I think this is certainly correct, sir. Among medical students not more than 5 percent of the students have scholarship assistance, and even in those instances the average is only \$500 per year as contrasted to the rather full support in many other scientific areas in terms of scholarship and related support. It is no wonder that we have a real problem in this regard. The opportunity for one who has a tendency toward a scientific career, for scholarship assistance and educational assistance in other fields of science make it perfectly obvious that many of our good students are attracted into such

scientific areas. Actually I think some students are deterred from going into scientific careers at all because they feel primarily an interest in medicine and yet find it difficult to face the obstacles of the tremendous expense and the time to be consumed in obtaining a good medical or dental education. I feel very strongly that this is a responsibility of our Federal Government. I am very hopeful that the act which has been proposed by the administration to help support medical schools and scholarships for medical and dental and related students will get some action in this session of Congress. As you know, the bill at the present time has only had hearings in the Senate. No hearings have been held in the House, and the Senate committee has not yet reported on the bill. As time goes along during this session of the Congress we are very distressed for fear that nothing is going to happen, and it will just put us another year further behind with this problem which is really mounting year by year. So I can assure you that we are going to exert every influence that we can in order to get the responsible committees in the Congress to consider further this recommendation in the hopes that we may get some action during this session of Congress.

Mr. FOUNTAIN. Is it your feeling that you do not at the present time have legal authority under the Public Health Service Act to make training awards for M.D. training?

Dr. TERRY. That is right, for general training we do not feel that we have the authorization nor the funds.

Mr. FOUNTAIN. What would be the attitude of the American Medical Association toward the granting of scholarships for medical studies?

Dr. TERRY. I understand that the American Medical Association—as a matter of fact they testified before the Senate committee—recommend Federal construction support for medical schools. They did not, I believe, comment on the other aspects of the program which include principally the cost of educational support to the schools and scholarships for students. The American Medical Association did not support the scholarship provision of this bill, and did not oppose it directly insofar as I am aware.

Mr. FOUNTAIN. Do you feel that the scholarship approach will attract more quality students?

Dr. TERRY. I think very definitely it would, sir. And one of the characteristics of our scholarship proposal is that the money for the scholarships would be available to the schools and would be administered by the schools. They would select their students, depending upon the quality of the applicants they have. There are relatively few limitations in this bill relating to the administration of the scholarship program. One is, for instance, that no student can receive more than \$2,000 a year. The prime prerequisite upon which the school would award the scholarship assistance would be that the student had talent and was in definite financial need to obtain a medical or dental education.

Mr. FOUNTAIN. What does the pending legislation propose in the way of scholarships?

Dr. TERRY. The legislation would authorize a formula type of grant to the school providing \$1,500 for 25 percent of the beginning class in each medical school for the first year. Each succeeding year



this would be extended to the next class. In other words, in the second year the first- and second-year class would be included; the third-year would include the third; and finally the fourth year would include all classes.

Now the provision does not require that the full \$1,500 be given to 25 percent of the students. This is merely the basis of computing the amount of money that would be made available for scholarship assistance. As a matter of fact, if it were deemed necessary or desirable by the schools, all of the students could get some scholarship help. In this case each student would receive one quarter of \$1,500 or \$375 per student in each of the classes involved.

Mr. FOUNTAIN. While this is an area outside our jurisdiction, I am curious to know what computations you have made as to the cost of this approach.

Dr. TERRY. I do not have those figures immediately available. I would be glad to submit them for the record.

Mr. FOUNTAIN. I would appreciate it.

(The information referred to follows:)

*Estimated Federal cost of scholarship programs proposed under H.R. 4999*

[In thousands of dollars]

Item	1962	1963	1964	1965	1966
Scholarship grants:					
For students.....	5,100	10,200	15,375	20,625	21,000
For school costs of education.....	3,400	6,800	10,250	13,750	14,000
Total.....	8,500	17,000	25,625	34,375	35,000

Mr. FOUNTAIN. Does the legislation call for a specified amount for scholarships?

Dr. TERRY. Just an authorization. There is no appropriation provision yet.

Mr. FOUNTAIN. Mrs. Dwyer.

Mrs. DWYER. Thank you, Mr. Chairman.

Do we have enough medical schools to take care of the qualified applicants at the present time?

Dr. TERRY. That is a very debatable issue, Mrs. Dwyer. In general our medical schools are said to have their classes filled. On the other hand, I know very well that there are some instances among our medical schools where they could have expanded their class another 10 percent had they had what they considered thoroughly qualified applicants. In general our schools, as they exist today, are considered to be filled but possibly with better quality students a few more might be taken by some of the medical schools.

If we are going to have more medical students, we are going to have to have larger medical schools and we are going to have to have new medical schools. Expansion of enrollment and new schools will be needed.

Mrs. DWYER. Then we will need more medical schools to take care of the needs of the country if this legislation is passed?

Dr. TERRY. That is right.

Mrs. DWYER. Dr. Terry, have you any idea as to why the American Medical Association has not supported this legislative program now pending in the Congress?

Dr. TERRY. Aid to the school, for the cost of education to the school, is tied to the fellowship proposal. For each of the \$1,500 scholarships that are made available to support students, there is a provision for \$1,000 for the school. In other words, they would get \$1,000 for each of the 25 percent of the class as a cost of education support for the scholarships.

It is my understanding that the American Medical Association is concerned about the Federal Government intruding itself into local and State problems by financing things within our medical schools, whether they be private or State institutions. I know of no other reason because I think they clearly recognize the need for support for medical schools as well as support for medical and dental students.

Mrs. DWYER. Thank you very much.

I have another question, but not on this particular subject. What is your feeling about the desirability of making grants available to individual scientists for research purposes, medical people for instance who are associated with local hospitals in a research capacity, with grant funds going directly to the scientist rather than to the institution?

Mr. FOUNTAIN. Dr. Terry, at any time you prefer to have one of your associates answer a question please feel free to do so.

Dr. TERRY. I think Dr. Shannon will be in a better position to answer that.

Dr. SHANNON. I was going to say there is nothing in our regulations or rules to prohibit that from being done. On the other hand, the continuity of the fiscal responsibility is such that we, as Federal Government, find it easier to do business with a stabilized fiscally responsible agent rather than with an individual.

Actually, in the smaller institutions, where individual scientists are concerned, which is, I believe, the situation you have in mind, we make many grants available to investigators in small institutions where this is the only outside support that the institution receives. We find no difficulty in the administration of those funds; we find nothing in the way of restrictive measures applied by the institution that would tend to limit the freedom of the investigator. But in general we would prefer to deal on fiscal matters with a stable, impersonal type of fiscal authority represented by an institution rather than with an individual.

Mrs. DWYER. Thank you very much.

That will be all, Mr. Chairman.

Mr. FOUNTAIN. Doctor, I believe that legislative proposal to which you have referred also has provision for a construction program?

Dr. TERRY. That is right, sir. And I might point out that a more favorable Federal local matching ratio would be provided in instances where there was an addition to an existing school allowing an expansion in enrollment, or for the construction of new schools. The provision is for 66⅔% Federal aid under those circumstances. For reconstruction or renovation of existing medical schools which is necessary for them to keep in operation, but does not result in any expansion in enrollment, the provision is for a 50-50 matching basis.

Mr. FOUNTAIN. I know from my limited experience with a number of students who have contacted me, the great difficulty seems to be



that there are just not enough facilities to accommodate all of the students who want to get a medical education.

I know in my own congressional district, within the last few years I have had several students try to get into one medical school or another who were turned down. In a few instances I think the boys had less than a B average. In other cases they had good grades, but an interview convinced someone that they were not suited for the medical profession.

However, one of these boys has been attending school in Switzerland for a number of years and he is now interning. He was determined to be a doctor even though officials at one school discouraged his continued efforts. He could not get into any of the medical schools here to which he made application, and he applied to quite a few in my own State.

Dr. TERRY. Generally speaking unless there are other factors a student today who has a B average from an acceptable college can get into medical school. That does not mean to say he can get into one particular medical school, but he can get into an accredited medical school.

In connection with your mentioning the boy getting his education in Switzerland—

Mr. FOUNTAIN. I might say he is operating on borrowed funds from local friends who wanted to see him get an education if he wanted it.

Dr. TERRY. We are importing about 1,000 practicing physicians every year, and yet from the standpoint of our international responsibilities we should be educating more medical and dental students than we need in order that some could be made available for less fortunate countries.

Instead of that we are depending on almost 1,000 a year being educated abroad. It is a serious situation, sir.

Mr. FOUNTAIN. On page 6 of your statement you say :

It seems to me, Mr. Chairman, that an essential step toward its solution must clearly be a comprehensive scholarship program for medical students which must, I think, ultimately be extended—or supplemented by a separate program—to cover internship and residency.

I understand that to some extent residency training is now included under the NIH program. In this connection, however, will you not be faced with the serious question as to whether or not this particular area is properly a Federal responsibility?

Dr. TERRY. Yes; this question is always raised.

As you noted in your statement, we are already supporting some residency training in highly specialized categories such as psychiatry, neurology, and ophthalmology where this is important to the training of scarce categories, and where there is a deficiency of well-trained persons capable of doing research in that area.

This was a personal prediction of mine, Mr. Chairman. Whether we will, and if we will, I do not know. I think, obviously, the first thing to be done is to get some support for education at the level of medical schools, dental schools, and so forth, and then see how the problem begins to work out.

I do not think we are going to get into any extensive programs of this sort in the next year or two, sir.

Mr. FOUNTAIN. Any other questions for Dr. Terry?

Mrs. DWYER. Does the draft for military service enter into the student's decision about going into medicine? I mean by that, does the extra time spent in the service of his country, which then pushes up the period of time he has to study to be a doctor, affect his decision?

Dr. TERRY. No doubt, it must have had some influence, Mrs. Dwyer, but I have not been able to personally evaluate it.

Of course, as you realize, most college and medical students who are doing acceptable work are deferred to complete their education. The medical student is, generally speaking, allowed to go through school as long as he is doing satisfactory work. He has the opportunity of getting this obligatory service over after he has gotten his medical training, and sometimes after he has had 1, 2 or 3 years' training beyond his medical degree.

Of course, there is a great variation in the value of the experience these persons have when they go into the Service. Some come into the Public Health Service to discharge that responsibility. And in general we feel that many of those get a very valuable experience during that time as a part of their training.

I think this is particularly true of those who are fortunate to come to the NIH, as an example, for this period of service.

Whether the draft situation has really affected the decision of many individuals is an issue about which I am not certain. In many instances they would be spending equivalent time in some type of training or experience at any rate.

Mrs. DWYER. I asked you the question because I have had at least 50 inquiries from my own district on this subject from prospective medical students. Thank you very much.

Mr. FOUNTAIN. Any questions, Dr. Goldberg?

Mr. GOLDBERG. No thank you, sir.

Mr. FOUNTAIN. I have just one further question which was raised by Mrs. Dwyer's question. I do not know how much truth there is to it, and it may not be true at all, but I hear frequently from various sources expressions to the effect that the various branches of the military service have on hand many doctors who are engaged in pursuits, administrative or otherwise, which might well be handled by nonprofessional people. Has the Public Health Service in any way contacted the military to determine whether or not that is true and if doctors now in the service performing such functions as I have described, and who have served a reasonable period of time, might be properly released to civilian status?

Dr. TERRY. I am not certain whether the Public Health Service has had any discussion with the military on this subject. Speaking for the Public Health Service, I can assure you that we have not had physicians in that sort of position. We have had in many of our programs a shortage of young physicians in order to carry out the strictly professional and medical and dental responsibilities which we have. One very good example of that has been in our Indian health program. We have not been able to afford the luxury of this sort of use of physicians. I do not think we would want to do it if we could afford it. I would hope we would not.

Mr. FOUNTAIN. I am sure you would not want to do it. We all know, regardless of our professions, there are certain administrative responsibilities that we have to carry out. I know when I was in

the service there were a number of surgeons who, having risen in rank to colonel and above, were no longer engaged in surgery. For example, I knew a colonel who was an excellent surgeon, in the installation where I was stationed, who was doing nothing but paperwork. And the higher they get the further they get away from the profession. I do not know whether it is still true in the services or not, but it seems to me to be a weakness in the setup.

Dr. TERRY. That is a real problem. As a matter of fact, I might say very frankly, from my personal standpoint, this is the only regret that I have associated with my present position. Up until 6 months ago I was, though I was doing a fair amount of administrative work in relation to the National Heart Institute, still continuing with some patient medical care responsibility. I have obviously found it impossible to do so in my present position. And as I say, this is the only regret that I have thus far at least of being in this position.

Mr. FOUNTAIN. I think the administration was fortunate in being able to select as the Surgeon General an individual who has already had experience in this area. And I certainly want to wish you every success in your undertaking. I know you have been in your present position only a short time, and I am sure I speak for all the committee when I express the hope that you will enjoy your work and accomplish all the things that you want to accomplish.

Dr. TERRY. Thank you, sir. I certainly appreciate that.

Mr. FOUNTAIN. Any other questions?

Mrs. DWYER. No other questions.

Mr. FOUNTAIN. Thank you very much, Doctor.

Dr. TERRY. Mr. Chairman, may I be excused?

Mr. FOUNTAIN. You may be excused.

Dr. TERRY. Thank you.

Mr. FOUNTAIN. Our next witness is Dr. James A. Shannon, who is Director of the National Institutes of Health.

Dr. Shannon, I believe you have a prepared statement which we would be very happy to hear at this time.

**STATEMENT OF DR. JAMES A. SHANNON, DIRECTOR, NATIONAL INSTITUTES OF HEALTH; ACCOMPANIED BY DR. DAVID E. PRICE, DEPUTY DIRECTOR; DR. ERNEST M. ALLEN, ASSOCIATE DIRECTOR FOR RESEARCH GRANTS; DR. DALE R. LINDSAY, CHIEF, DIVISION OF RESEARCH GRANTS; AND JOSEPH S. MURTAUGH, CHIEF, OFFICE OF PROGRAM PLANNING**

Dr. SHANNON. Thank you very much, sir.

Before making some general observations about the questions raised by the committee's report, I should like to introduce several members of the NIH staff who are here this morning so that they may be available to discuss, in more detail than I shall be able to do, some of the points which members of the committee may wish to raise.

Dr. David E. Price is, as you know, Deputy Director of NIH. He has, since he assumed this position a year ago, been much involved with questions of policy affecting the extramural programs, and has been deeply concerned about some of the same problems which this committee raises in its report.

Dr. Ernest M. Allen, who has just joined us at the table, is our Associate Director for Research Grants. This position was created—as part of the reorganization of the top administrative staff a year ago—because we recognized that the NIH grant programs had grown so large that policy direction and supervision needed to be strengthened. Although he has a new title, Dr. Allen is an old hand at research grant administration, having been Chief of the Division of Research Grants for the preceding 10 years.

Dr. Dale R. Lindsay, who is behind me here, has succeeded Dr. Allen as Chief of the Division of Research Grants. He has also had long firsthand experience in the administration of NIH grants, having been Deputy Chief of the Division since 1955.

Mr. Joseph S. Murtaugh, who Dr. Terry introduced, is Chief of the Office of Program Planning, which is part of my office. Mr. Murtaugh since he came to NIH 5 years ago has made extensive studies of various aspects of our extramural operations and has participated fully in the review and development of policy.

I shall look to these gentlemen to assist me in giving as full an account of the background and the present status of our administrative practices and problems as you, Mr. Chairman, and other members of the committee may wish. But I should like first to review briefly our basic approach to our grantmaking responsibilities, then to discuss the general policy problems—as they affect grant administration—arising from the rapid growth and broadening of our extramural programs, and, finally, to make some summary comments on the various observations and recommendations contained in the committee's report. I may say that the report—due, in no small measure, to Dr. Goldberg's understanding and diligent study of our programs—is a very helpful document.

It is the responsibility of the Public Health Service to protect and promote the health of the American people through a variety of means. Within this broad mission it is the special responsibility of the NIH to develop new information which will make this activity more effective. The NIH responsibility is discharged through a series of programs, categorically oriented toward major diseases, which include the conduct and support of research and research training and participation with non-Federal groups in the provision of adequate research facilities.

Because of the breadth of these programs the only valid criterion of their effectiveness—and the yardstick by which the Appropriation Committees of both houses of Congress have, in fact, judged performance—is the progress made in expanding biomedical knowledge and in improving preventive, diagnostic, and therapeutic measures. The American people have decisively demonstrated their desire for an all-out attack on the major disease problems both in their vigorous support for the NIH programs and in their generous contributions to the voluntary health agencies and non-governmental research organizations. The Congress has responded to this desire by substantially increasing the NIH appropriations at a rate determined largely by the national capability to perform research of excellence.

Growth within such a frame of reference greatly increases the NIH's burden of responsibility for distributing the funds made available through mechanisms which are prudently conceived and operated



to insure, on the one hand, substantive excellence and, on the other, sound accountability of the funds so expended.

The Federal Government's current investment in medical research through the NIH programs supports nearly half of all the medical research performed in this country and is thus a major influence in determining the direction of the total national effort in this vitally important field. The management of the Federal Government's investment therefore involves and affects the entire scientific community. As the NIH programs are, in the aggregate, the most potent single force influencing the biomedical research and teaching and—at only one stage removed—medical practice, the exercise of wise scientific leadership in administering these programs must be our constant and overriding concern.

The basic premise on which all NIH programs have from their inception been based is that its grantees—and to a very large extent also the scientists working in NIH's own laboratories—must be allowed the greatest possible freedom of action in determining the nature, the direction, and the conduct of their research. This is not only a wise policy, Mr. Chairman, it is an essential policy. The history of science conclusively demonstrates that scientific inquiry will only flourish if the investigator has freedom to follow the dictates of his intellectual interests and capacities. In specially selected cases it is possible, and, in fact, profitable, to engineer a research effort; that is, to undertake broad collaborative studies wherein group judgment is substituted for individual judgment but this is only possible when when the immediate objective is clearly recognizable.

Generally speaking, however, new knowledge of a revolutionary sort—commonly called a scientific breakthrough—cannot be engineered, cannot be predicted and consequently will not yield to science-direction however brilliant. In the future, as in the past, it will arise from an unexpected quarter. The way to scientific progress is not along an identifiable road but across a long and ill-defined front. Advances will come most quickly if competent investigators are encouraged to deploy themselves where their hunches take them and are allowed to proceed in a manner that seems to them most effective.

In addition to the inescapable need for scientific freedom and the desirability of a wide dispersion of effort, we have in this country a valuable tradition, deeply rooted in history, that educational institutions should remain free of Federal control. As the bulk of biomedical research is conducted in educational institutions, this tradition reinforces the NIH policy of keeping grants as free as possible from direction and restriction.

In general, we do not—and must never—look upon grant support as paying for work done for the Government and therefore subject to the fair accounting which any purchaser of a definable product has a right to expect from a vendor. We must, rather, look upon it as the underwriting by the people of this country, acting through the Congress, of a vast private effort which is in their personal interest because it holds out to them their only hope of longer and healthier life. The first obligation of the managers of the grant process is to insure that this hope is fulfilled as rapidly as possible.

These comments are concerned with management practice, terms, and conditions of individual grants which in the aggregate compose

the total program. When viewed as a total we have other responsibilities. We must be certain that the terms and conditions of support at the very least are not prejudicial to the best interests of the educational institutions within which they are contained and through substantive analogies of program must maintain an awareness of progress and trends insofar as these forecast needs and opportunities for the future which must be provided for.

Thus far I have spoken only of our obligation from the point of view of the most rapid progress of science. But no Federal administrator can be unaware that the stewardship of public funds imposes other obligations. It is not a moral duty but a requirement of law that he apply himself diligently and constantly to the task of insuring that public funds are not misused or wasted, that the public receives good value for the expenditure of the tax money, and that it is spent for the specific purposes for which the Congress appropriated it. These obligations are common to all Government programs and the principles for achieving efficiency, economy, and accountability are well established.

In addition, therefore, to the responsibility for insuring that the medical research effort is as vigorous and effective as the intellectual and physical resources available to it will permit, there is the concurrent responsibility for seeing to it that the money which the Congress has made available for this purpose is wisely and economically spent. The discharge of these two forms of responsibility is not necessarily incompatible. They do, however, involve two different approaches—two different frames of mind—which sometimes are divergent when specific program guidelines or administrative decisions have to be made.

These conflicts have been increased and aggravated by the rapid growth of the NIH programs. In a grant program totaling more than \$400 million (as it did in 1961) and with projects in every State of the Union and about 40 foreign countries there is obviously a great risk that some of the funds will be wastefully, improperly or even dishonestly used. It is common experience that as the dollar volume of a program grows, the controls exercised over it must become more formal and rigid.

However, the growth of a research support program also increases the danger that there will be too much central supervision of activities which, to be effective, must be individual and nonconforming to any standard pattern. The Senate Appropriations Committee, in its report on the NIH appropriation made public last week, noted that it is now "difficult to find any area of medical science that does not benefit directly from the NIH programs and equally difficult to find any contribution of note that cannot trace direct descendancy to at least partial support from these programs." If educational independence and scientific freedom are to be maintained it is clearly essential that so ubiquitous a support program be kept free from any taint of direction or central control. As the programs continue to grow, it is increasingly necessary—from the point of view of their effectiveness in stimulating scientific inquiry—to make the grant mechanism less rigid and less specific.

It seems to me, Mr. Chairman, that just as we must—and do—rely on the scientific judgment of institutions and individual investigators to determine the manner in which grant funds can be most effectively



spent in the achievement of their research objectives, we must by our policies and procedures engender a high degree of responsibility and sense of integrity on the part of institutions and investigators for the proper and efficient use of the Federal funds made available to them.

I think we must assume that in any program involving 1,100 institutions scattered throughout this country and abroad and involving 11,000 individual grants, some unwise or ill-considered practices are bound to occur. They result from ignorance or misunderstanding of the regulations, from carelessness or inadvertent error in their application, or—and this is the more likely source of trouble—from a difference of opinion about what constitutes a proper expenditure. It is my firm conviction that cases of deliberate disregard amounting to fiscal malpractice have been—and will continue to be—very rare indeed. What might well be regarded as abuses will, I suspect, also occur in a very tightly monitored program of similar size and complexity. I must confess that I have been much gratified that the committee study did not find a larger number or more grievous examples of abuses.

At the same time, I am distressed by the evidence of poor practices which have been brought to light. They clearly point up the need for certain revisions in our procedures. Indeed, what I have been saying was not intended as a defense of the status quo but as background for a consideration of what can reasonably and appropriately be done to minimize the risk of improper use of public funds in the support of research.

The only point I would emphasize is that the problem must not be looked at solely from an accounting and auditing point of view lest we run the even greater—and, in the long run, more costly—risk of using the funds with less than maximum effectiveness for the purpose for which they are intended.

I am certain that all responsible officials of NIH are in complete accord with the objectives of this committee. Its findings and recommendations have already received serious consideration. Some we explored and acted on before the report was published, other parts have since been met by various procedural and policy changes, and the remainder are at present under active study. An interim report on NIH actions and attitudes with respect to the recommendations was submitted to you, Mr. Chairman, on July 25.

Perhaps it will be helpful to your purpose this morning, Mr. Chairman, if I briefly summarize our actions and comment on those recommendations and observations which are directed at NIH.

The first recommendation relates to the review of research project applications and includes two suggestions for a more meticulous examination of the budgets of grant projects.

While it is true that study sections and councils have in general concentrated on the scientific merit and general reasonableness of a proposed project, they have evidenced a real concern for the appropriateness of the budget put forward. There have been many instances when individual budget items have been disallowed and struck from the application.

As a matter of fact, the report of this committee indicates that the amount allowed on grants runs from 5 to almost 15 percent less than

the amount requested in applications. While this process has the effect of giving the grantee a lower award, it does not bar him from using the grant funds he does receive as he thinks most suitable.

It is our firm conviction that the earmarking of grant funds, or insistence that the grantee adhere to the estimates he put forward in his application, would very seriously hamper the effective conduct of research—whose course is in so many respects quite unpredictable—and would thus run counter to the primary purpose of the grant program.

However, a good case can be made—as is done in the committee's report—for a more businesslike approach to research project costs. We have therefore decided to modify our procedures with a view to asking the study sections and councils, in effect, to set a dollar ceiling for each grant they approve leaving the exact amount to be paid to be negotiated, when necessary, by the staff. It would be quite impractical to ask the study sections to do this. Their members are purposely chosen for their scientific competence—they have neither the background, the time, nor the inclination to act as budget examiners.

As some 15,000 applications must be reviewed each year, the time needed for detailed budgetary reviews could alone make it impossible to use study sections for this purpose.

The amount to be paid in subsequent "continuation" years of multi-year grants, and the purpose for which these funds will be used, will be similarly negotiated by the staff on the basis of actual need but within the ceiling set during the initial review process.

The new procedure will permit study sections and councils to award long-term support with greater confidence since they know that details of the budget will be subject to annual staff review. It will facilitate better accountability, but it will also substantially increase our administrative cost to conduct meaningful budget reviews for 15,000 projects—I can only hope that it will result in a net saving for the Government.

The new procedure and the more detailed exposition of costs which the revised application form will require will make it possible for the staff to make a better assessment of equipment needs. However, we do not believe that it is practical or useful to attempt to maintain detailed records of equipment purchases by each grantee institution.

Not only would this require continuous surveillance of a kind sharply at variance with the philosophy of mutual trust on which our relations with research institutions must be based—frankly, Mr. Chairman, if we cannot trust a medical school or a university department we should better not do business with it at all—but even if it were acceptable it would be of little practical value since the condition of the equipment, its physical location, the availability here of necessary ancillary equipment, the other purposes for which it is used, and other variable factors frequently determine its suitability for a given research project.

Special review panels to consider large program grants have already been established, as suggested by the committee, under a new Special Programs Review Branch in the Division of Research Grants.

The membership of these panels has been specially selected with a view to including on them persons with experience in research management and cost accounting as well as those having the requisite scientific competence.

The feasibility of forming field review teams, as suggested by the committee, is now being studied by an NIH task force. Without prejudicing the conclusions, I may say that the idea appeals to me. A substantial proportion of NIH research grant activity is probably located within a radius of about 500 miles of five major cities. Establishing field teams of the Division of Research Grants in such cities would enable responsible NIH officials to maintain close and continuing contact with the entire range of each institution's programs and would facilitate close administrative relations between NIH staff, applicants, and institutions.

Suitable feedback of information would permit study sections and councils to judge research projects against the total framework of research, training, and facilities support at a given institution. I might add that such an arrangement would also facilitate negotiations on the financial details of research grants to which I have already referred.

I am confident that the instances of the use made by commercial firms of NIH grant funds, which are mentioned in the report and to which the committee took exception, are not typical. Some very fine work has been done by commercial firms of NIH grant funds, which are mentioned in the report and to which the committee took exception, are not typical. Some very fine work has been done by commercial firms under NIH grants and I am sure that propriety in handling Federal funds has been the rule rather than the exception.

Nevertheless, the relationship between NIH and commercial firms is fundamentally different from its relationship with educational institutions, hospitals, nonprofit research organizations, and the like, and the considerations which must govern the latter relationship do not apply to the former.

We have therefore tentatively decided to support investigators working in commercial firms only on a contract basis in which the conditions of the support can be spelled out in as much detail as may seem necessary. A task force is now exploring the feasibility of converting outstanding grants of this type to contracts.

I might point out, in order to put the scope of this problem into perspective, that we make very few grants to commercial firms. In 1960, the latest year for which I have figures, they accounted for only one-fourth of 1 percent of grant funds; that is, about \$600,000 out of \$200 million.

We heartily agree with the committee's recommendation that we should establish a separate policy governing support for meetings of scientific organizations rather than accommodating them rather awkwardly, as we have done heretofore, under the project grant system. To this end a new policy statement has been developed and revised procedures established. Under the new rules, applications for conference grants will have to contain a much more detailed budget than is required for a research grant and no transfer of funds between budget items will be permitted once the grant is made. No funds will be provided by NIH for the purchase of equipment, for the payment of honoraria or consultants' fees, and no indirect costs (or overhead) will normally be allowed.

The suggestions that NIH initiate a special developmental grant to stimulate research in institutions not now actively engaged in it raises an important question about the role of NIH. We recognize our responsibility for stimulating research and for enhancing this country's research capacity through the support of training and the construction of research facilities. In fact, programs with these specific objectives are receiving considerable emphasis.

Under the new general research support program, a new program being launched in fiscal year 1962, all eligible institutions will receive a formula grant ranging from \$25,000 to \$30,000 to be used for the general strengthening of the medical and health related research and research training program; these grants will be available to medical, dental, osteopathic, and public health schools and should meet the need to which the committee report refers as far as these schools are concerned.

However, the contemplated extension of the program to other academic and research institutions will be limited to institutions which already have substantial research programs supported by NIH. Although these grants will, in certain cases, serve developmental purposes, they are primarily designed to give institutions with active research programs the means for exercising greater freedom and initiative in developing new approaches.

The steady and substantial increases in the NIH budget have made enough funds available to enable most schools to get one or more project grants—this is indicated by the 70 percent increase between 1957 and 1960 in the number of institutions receiving some NIH grant support.

If in these circumstances an institution has not been able to get approval for a single grant, it must be assumed that its research work has been of a fairly low standard. If this is the case, it is probably true that its teaching program, its faculty, and its facilities also need strengthening. In that case the problem is one of general educational support. It is my personal opinion that this is, in fact, a serious national problem on which action is already long overdue, but it is not a problem for which NIH has either the authority or the means to address itself.

In any case, the decision to allocate faculty energies to research properly rests with the institution and its scientists. There is every opportunity to compete on the basis of excellence for support through NIH grant programs. There is every opportunity to obtain support for training programs which will produce tomorrow's research workers. There is every opportunity to obtain support for the construction of facilities essential to the conduct of research—and indeed, more than 225 colleges and universities have received such assistance under the health research facilities construction program. To these existing programs, we are now adding the general research support grants. It seems to me, therefore, that ample opportunities for research support are already available to those institutions that desire to do research.

As the committee is well aware, NIH at present has no authority to make grants to Veterans' Administration hospitals, and I note that its recommendation that this be done is addressed to the Congress and not to NIH. At the present time, VA employees who have bona fide



affiliations with medical schools are eligible to apply for such support through the medical school as a staff member.

The administration has proposed a broadening of this relationship and has submitted authorizing language to the Congress for this purpose. If this authority is provided, we shall endeavor to implement it to obtain the maximum return on the excellent research potential represented by the VA program.

We have been for some time well aware of the need for a greater degree of uniformity in and simplification of our various training programs which differ considerably among the various institutes. I may say that these differences are now considerably less great than they were 2 years ago when I appointed a task force to review all the training programs. Since then we have had both the administrative and policy problems of our training programs very much in mind. The problem of coordination is partly due to the somewhat different training missions and training policies of the various institutes and to the different needs of the scientific and clinical fields which they serve. It has, however, been further complicated by the very rapid expansion of our training programs which have grown from \$34 million in 1957 to \$132 million in 1961—a fourfold increase in 4 years.

It is my view that there should now be a moratorium of at least a year in this rate of growth to permit the schools to adjust to these programs and to give us an opportunity to reexamine our training policies and reassess future needs. But as the members of this committee are probably aware, I am somewhat at odds in this respect with the Appropriations Committee who are understandably reluctant to interrupt the development of these important programs.

As matters stand, both Appropriations Committees have instructed us to prepare a report on long-term research manpower needs and to make specific recommendations for the future development of these programs, during next year's appropriations hearings. I intend that this review shall also take into consideration the questions of uniformity and simplification.

I might add that the language in the Senate Appropriations Committee report took note of our problem and expressed the wish that a part of their proposed increase be utilized immediately to satisfy needs arising from an increase in the cost of doing business but that new programs be delayed in their initiation until the preliminary aspects of the projected study is completed.

These things we most certainly will carry out.

During the past 15 years, the problem of indirect cost has received a great deal of attention in the executive branch, the Congress, and the universities. Quite frankly, it ought to be acknowledged that, in essence, the determination of the indirect cost rate to be paid by the Federal Government for sponsored research is no longer an accounting question; it is a political problem.

When I use "political" I mean political in the best sense, in that this is a determination of public policy as to the extent to which the schools will or will not participate in these indirect costs, and has little to do with the scientific issues involved and must be settled within a framework of reference quite outside the scientific and the technical questions that bear on the point.

However, as a scientist-administrator I must face the fact that the way in which this problem is resolved will affect the ability of NIH to perform its research mission. Substantial cost-sharing, as recommended by the committee, would seriously restrict the ability of some topflight investigators and institutions to participate in our programs. Many institutions claim that our current indirect cost rate of 15 percent covers less than half of the actual overhead costs. And in this sense cost-sharing is already in operation.

Both the present administration and the previous administration have proposed in budgets submitted to the Congress that the maximum indirect cost rate allowable on NIH research grants be raised to 25 percent. While this view has found sympathy in the Senate, it has consistently been rejected in the House.

It is my understanding that the National Science Foundation has prepared an interim report on this subject for the Federal Council for Science and Technology. This report is based on a comprehensive survey of institutional practices which the Science Foundation has converted to a common base as suggested in this committee's report.

From this calculation it appears that a flat rate of approximately 25 percent would on the whole provide for an equitable reimbursement of indirect costs as measured under the principles laid down in the Budget Bureau Circular A-21. I believe this study and its review will be the basis for further action by the administration in this complex area. I should like to say that the arbitrary restriction on the payment of indirect costs, such as applies to the NIH, does an injustice to the participating institutions.

NIH is, of course, more than willing to continue to improve its methods for coordinating research activities with other agencies, as the committee suggests it should. I think that NIH may claim to have taken a lead in this field a number of years ago when it set up, within the Institutes, an information clearinghouse which later was transferred to the Smithsonian Institution to become what is now the Science Information Exchange.

The SIE, as it is called, serves all interested agencies and NIH uses it constantly to supply data on other grant support that is currently being given to applicants for NIH grants.

We also draw on the SIE for ad hoc grant tabulations useful to us in policy discussions. The difficulties in making suitable arrangements for registering our intramural research with the Exchange have finally been resolved and this information is now being supplied by us. Incidentally, we think well enough of the Exchange to contribute \$170,000 annually to its support.

Coordination of a less formal nature with the other agencies interested in health research is, I think, satisfactory and I am pleased to note that the committee's report agrees that we have developed workable arrangements for avoiding undesirable duplication of project support.

Actually, our internal arrangements for collecting and analyzing program data give me more concern than the channels we have open to us for interagency data exchange. I am very much concerned by our need for solid statistical information which we should have currently available for program development and evaluation. Two years ago we set up in the Division of Research Grants a reorganized and greatly expanded Statistics and Analysis Branch.



Progress has been made in laying the groundwork for a more comprehensive and flexible statistical reporting system. In this process considerable time had to be spent on developing new data collecting specifications and new codes, and for working out arrangements for automatically acquiring the necessary input data. As was to be expected, there were thorny problems integrating old data for earlier years into the new system and the whole operation was complicated by a large increase in the coming year resulting from the budget increases voted by the Congress. This growth has made us wonder whether our earlier organizational decisions do in fact provide an adequate framework for this task.

In this connection, I might point out, however, that the central statistical unit on which we hope in the future to rely for much of our program data, is not now—and will not be—the only source of statistical information. Each of the Institutes, in varying degree, maintain program analysis sections which compile and evaluate program data to serve the immediate needs of the Institute, and, to a very helpful extent, my office. In addition there is in the Office of Program Planning, which is part of my office, a Resources Analysis Section. This group, which has also been gradually expanded during the past 2 years, is primarily responsible for collecting and analyzing data relating to the national research effort but it has, on an ad hoc basis also undertaken a number of internal program analyses and other statistical exercises which were urgently needed as background for specific policy problems.

I do not pretend, Mr. Chairman, that I am satisfied with our arrangements for making readily available the information needed for effective program management. On the contrary, I am very much concerned about it and we are currently very actively considering what further steps we can best take to remedy this deficiency.

There is one other point in the report about which the committee has not made a recommendation, on which I should like to comment. This is the statement (on p. 29) that there is a close relationship between the institutional affiliation of scientific advisers and the distribution of grants. The report goes on to say that the committee does not impute bias or unfairness to the study section members but it also goes on to express concern about "the normal tendency of advisers to favor institutions and scientists they know best."

I think, Mr. Chairman, that this leaves an unwarranted implication that the study section members are unintentionally unobjective in their decisions.

The same criterion governs the selection of study section members by NIH as governs the approval of grant applications by the study sections—that is, excellence. It is our view that excellent scientists are best able to judge the excellence of proposed research projects. It is therefore true, as the report points out, that—

it is only logical that NIH should look to those educational and research centers in which these outstanding scientists are located.

It is also logical, Mr. Chairman, and necessary to the accomplishment of the NIH mission of promoting the health of the American people, that a high proportion of its research support should go to the outstanding scientists in these educational and research centers.

One would therefore expect a close correlation between the number of study section members drawn from a given group of institutions and the number of grant dollars awarded to them—not because the one decided the other, but because both selections are based on much the same consideration of excellence.

One might suspect bias if the proportion of the available funds going to the leading institutions was higher than their representation on the study sections. But actually the reverse is the case.

Table 10 on page 29 of the report shows that the 16 leading institutions, receiving more than \$2 million each of NIH support, and representing 45 percent of the study section membership received only 35 percent of the grant funds. The group of institutions receiving between \$500,000 and \$2 million in NIH grants, similarly, had 40 percent of the study section membership, but only 35 percent of the grant funds. But the group of institutions, numerically by far the largest, receiving less than \$500,000 in grants had only 15 percent of the study section seats but had 30 percent of the grant funds.

It can, of course, be argued that the smaller institutions are under-represented on the study sections—that if they merit nearly a third of the support, they should have a third of the memberships in the review groups. I think that such an approach would be a serious disservice to a review system which has repeatedly demonstrated its effectiveness and fairness. I submit, Mr. Chairman, that the higher proportion of funds awarded to the smaller institutions reflects an awareness on the part of the study sections of the need to stimulate and encourage research in places other than those in which it already flourishes.

I should like to assure the committee that its recommendations and each of the problems discussed in the report will receive further careful study and that we shall pursue, with even greater vigor, our constant efforts to improve our administrative procedures. A report on the additional steps which we propose to take will be submitted as soon as these are firmly developed. Meanwhile I and my staff are ready to answer any questions you may have or to supply such additional information as you may desire.

Mr. FOUNTAIN. Thank you very much, Dr. Shannon.

Dr. SHANNON. It was a long statement and I thank you for bearing with it.

Mr. FOUNTAIN. It is very helpful and informative.

For the benefit of the members of the subcommittee, I will direct some questions to Dr. Shannon in connection with the recommendations of the Government Operations Committee and the related comments of the National Institutes of Health as set forth in their position paper, or summary report, of July 25, 1961, inasmuch as I have had an opportunity to examine this a little more closely than the reading of Dr. Shannon's statement this morning. The document referred to is entitled "Summary of NIH Actions and Attitudes With Respect to the Recommendations Contained in the Report: Health Research and Training—the Administration of Grants and Awards by the National Institutes of Health."

If there is no objection, and so the record will be orderly for reading purposes, as I proceed to each of the recommendations of the committee, and the response of NIH, we will insert the recommendation

and response (as they appear in that document) preceding our questioning about them.

Mrs. DWYER. No objection.

Mr. FOUNTAIN. Before I proceed, however, I would like to know if there are members of the subcommittee who have specific questions concerning Dr. Shannon's statement this morning.

Mrs. DWYER. No questions, Mr. Chairman.

*Recommendation No. 1—Additional measures be taken to improve the effectiveness of the present project review system*

First. The scientific review conducted by the study sections should be complemented by a thorough review of each project's financial requirements performed by qualified analysts in the Division of Research Grants (p. 33).<sup>1</sup>

Second. NIH should consider the feasibility of forming field review teams composed of staff representatives to visit grantee institutions on a regular basis, perhaps once a year (p. 34).

Third. NIH should determine the dollar amount of support, for projects receiving grant commitments for extended periods of time, at frequent intervals and on the basis of an adequate review of program accomplishment, potential, and financial needs (p. 34).

Fourth. Special advisory committees should be organized to review grants which are intended to provide general support for whole programs or divisions of institutions (p. 35).

*NIH action*

NIH is in the process of implementing these recommendations by strengthening its procedures and staff for more thorough examination of the budgets of research proposals. Under these revised procedures, study sections and councils will review applications and establish ceilings for future support subject to annual staff negotiations of the precise amounts to be awarded. These procedures will insure closer scrutiny of equipment requirements in order to determine the essentiality of proposed equipment purchases, particularly when similar equipment has been provided under earlier grants. This budgetary review procedure will also facilitate continuing contact with grantees through determination at frequent intervals of the dollar amount of support required for projects receiving long-term support.

Specifically, a revised application form to be used by investigators in requesting previously recommended years of research grant support (PHS Form 2590) has been prepared (see attachment I). This form, and the accompanying instructions, require each PHS grantee to provide a substantially more detailed exposition and justification of each year's research budget than has hitherto been required. The grantee is now being requested to explain any significant change in the proposed use of funds as compared with expenditures during the current year grant. Changes in the investigator's plans for the purchase of equipment will be detailed in order that an appropriate evaluation of these requirements can be made.

This improvement in the review of budgetary requirements of research projects will enable study sections and councils to act with greater confidence in awarding longer term support when they know that the details of the budget will be subjected to annual staff review and negotiation. This enlargement of the review process will of course substantially increase administrative costs.

Consideration has been given to maintaining detailed records of all equipment purchased on PHS grants in order to assess the need for new equipment in each department of every grantee institution. Firm conclusion has been reached, however, that the adoption of such procedure would be impractical and potentially very damaging to the grant program. To accomplish such an end would require continuous Federal surveillance of the condition of each piece of major equipment in hundreds of private and State universities and hospitals; the frequency of its use by thousands of research workers in the department and related departments; and the availability, condition, and use

<sup>1</sup> The page number cited here and in the recommendations which follow refer to House Report No. 321, 87th Congress, entitled "Health Research and Training—The Administration of Grants and Awards by the National Institutes of Health."

of the many accessory units which frequently determine the suitability of a complex instrument for a particular research requirement.

The National Institutes of Health has a task force at work exploring the feasibility of using field review teams. This task force is charged with recommending the most appropriate ways and means of using field review teams in a manner that will sustain the quality of review, be sensitive to Institute statutory responsibilities and missions, and establish optimum rapport with institutions and investigators. A definitive evaluation must await the considered appraisal of the task force.

With regard to the fourth element of this recommendation, NIH has already established special advisory groups for larger grants which provide support for whole programs of institutions. This action was taken because, as noted by the committee, "large grants of this kind are not for projects in the conventional sense, and consequently, require a special type of review by a competent body." Review of applications for such program project support involves considerations of institutional organization, complex problems of administration, and other features not present in the regular project grant.

The National Institutes of Health has already completed the establishment of seven such special review panels, with two more to be added shortly, organized with these objectives in mind. In addition to scientific competence, the membership of the committees includes individuals expert in medical administration, research organization, hospital business management, and research cost accounting. These panels, and additional ones to be added as required, will be administered by the new Special Programs Review Branch in the Division of Research Grants, and will commence meetings during the fall of 1961. All applications for program support will continue to receive a second review by the appropriate National Advisory Council.

A supplemental policy statement has been prepared and disseminated clarifying the objectives and conditions surrounding the award of grants for the support of major programs of research (see attachment II).

Mr. FOUNTAIN. Dr. Shannon, I have examined your revised form PHS 2590 to be used by grantees when applying for previously recommended years of support. This appears to provide considerable information for administrative purposes without being unreasonably burdensome to the scientists. Has this revised form been placed into effect?

Dr. ALLEN. Its duplication is completed and we are ready to mail it. The new procedure will apply to all future applications that come in.

Mr. FOUNTAIN. Fine. I think that form is a tremendous improvement over your former system.

Dr. SHANNON. Mr. Chairman, may I use the device of indicating which of my staff is able to give you the best answer?

Mr. FOUNTAIN. Would you do that, please?

Dr. SHANNON. Thank you.

Mr. FOUNTAIN. We are very glad to have you do that because we know you do not have all the answers to all the questions. You could not possibly.

Your summary report states that enlargement of the review process will, and I quote, "substantially increase administrative costs." Based on our study of your rather loose arrangements in the past, we would expect that adequate review procedures would produce significant net savings in your program and, naturally, we would expect you to provide adequate staff for this purpose. That is necessary regardless of the cost.

However, in view of your use of the word "substantially" in describing an anticipated increase of administrative costs, I wonder if you would outline for the subcommittee the kind and number of staff you plan to add.



Dr. ALLEN. There would be two steps. The immediate implementation of this procedure would be to add a budget analyst for each of the Institutes. This would mean a total of eight plus an assistant at probably a GS-5 level for each of the analysts. There would be travel involved for these people, undeterminable in amount. In fact, it would be a bold guess if I were to tell you how much there would be. We have tentatively assumed that the immediate cost would be somewhere between \$100,000 and \$225,000 for the salaries of the staff and for the cost of providing for their travel expenses. In the long run though, we will have review committees that might be located in the several cities that Dr. Shannon mentioned. Again, we have no way of determining just what the cost will be, but this is something a committee is working on and is studying.

If I may add one thing, though, I believe that the revised form that you have just referred to puts the onus on the institutions and investigators to identify equipment which was previously described in an application but not purchased, and equipment which duplicates existing equipment for which they must provide in the application an explanation of a need for additional items. In this manner such requests can be evaluated.

For that reason I do not think the new procedure will cost us as much as it might have.

Dr. SHANNON. Mr. Chairman, could I comment on this problem?

I would like to comment primarily for the future. At the present the program is going into areas that heretofore we have not supported. I have in mind large grants in support of clinical investigative procedures and the development of other type of centers. As we proceed along these lines, this presents the additional complication of the superimposition of quite a different program on an old program, for which we have a very good and solid staff. Thus, it is difficult to determine precisely what the additional cost will be. In certain of these new programs we would have to put people in the field because most of these awards will be negotiated grants for large programs of activity rather than simple research grants that a council can make a judgment on. So that we will have, unfortunately for simple accounting practices, two types of new activity handled by basically the same group. Now, what we will try to do is try to separate those so we can get some idea of what the additional administrative operation would cost. But, Mr. Chairman, this is going to be, in the final analysis, a judgment and decision on our part as to how we will partition costs for old programs as compared to new.

Now, the second thing is that we are also attempting, in certain stable institutions which have been receiving grants now for a decade, or a decade and a half, to combine some of the smaller grants into a more comprehensive grant when these grants are quite closely related one to the other. This again involves on the spot negotiation, not only with the scientists, but also with the administrative people who are responsible for maintaining the environment. So this is an activity which will be added over and above that which has been conventional in the past.

So I just want to stress that we are involved in these changes of administrative practices for existing programs as well as in new areas of programs which are opening up. These changes involve precisely the same type of negotiation that this committee has recommended.

This means that the combination of the two will make each of them less expensive than were they undertaken alone. But it also means it will be more difficult for us to decide in retrospect how much one, as opposed to how much the other, costs.

Mr. FOUNTAIN. To what extent, Dr. Allen, do you think these positions to which you have referred can be filled by, or serve to replace, staff at the Institutes who are now doing less essential work?

Dr. ALLEN. I do not think—

Mr. FOUNTAIN. If at all?

Dr. ALLEN. I do not think they will replace anyone. I think this is an additional task. As Dr. Goldberg has commented to you I am sure, we have not been doing this type of thing before. The study sections have reviewed the budget proposals and, in many instances, reduced the budget—recommended elimination of items that were unnecessary in the light of personal knowledge that they had. This new proposal is for systematic, routine review of all of the applications as they come in, at least those \$20,000 and larger. I think for those smaller than \$20,000 it would be uneconomical to address ourselves to a detailed budget analysis, but for the larger ones under this new procedure it would be a regular part of the review process.

I should like to add that I do not think that we have people at NIH that are unnecessary. It has been difficult, as the program has grown, both in volume of business and complexity, to secure the staff we really need to do the job. If we had, their help probably would have kept you from having as many recommendations.

Mr. FOUNTAIN. I had in mind people who were doing useful but less essential work, who would be qualified for these particular positions.

Dr. ALLEN. Well, actually, as these positions are activated and the analysts begin their regular work, they are going to have to turn to professional people for judgment on many of the things that they will find. They will detect certain items of equipment that are questionable, but they will not be prepared to exercise a technical judgment and will have to use professional people to help out on this.

Mr. FOUNTAIN. On page 2, your summary document, which I hold in my hand and which was distributed to members of the subcommittee, is very critical of detailed equipment records. And I might add at this point that this committee did not recommend detailed equipment records. That is the language of your report which states that such records would be "impractical and potentially very damaging to the grant program."

Even though that was not the committee's recommendation—we made our recommendation in a different form—I would like to ask in what way detailed records would be damaging to the grant program.

Dr. ALLEN. May I comment first on why we put the paragraph in? As you know, we said we had considered this step. It was in an effort to strengthen, to tighten our procedure, that reference and observations were made about detailed equipment records. This possibility was one of the things we considered and dismissed, and we thought you would be interested in knowing that we had gone to that extreme.

Mr. FOUNTAIN. I just wanted to be sure that was not in response to our suggestion.



Dr. ALLEN. Yes. One reason we think detailed equipment records would be damaging is, for example, the very volume of applications that come in—Dr. Shannon mentioned 15,000 applications. Actually, there is a later report that is just coming out that shows we will have 17,000 in the last completed year.

These applications have to go to the 41 study sections and 2 review committees, the number we now have instead of the 39, Dr. Goldberg, when you were looking at the program. And even so, with that many committees, we have to set up special ad hoc groups to review some of the applications because of the needs for technical and professional competence that is not represented on any existing study section.

Well, the same principle applies in the examination of the equipment itself. It would be impossible for us always to have the right men judge whether some piece of this equipment is really justifiably an additional item—whether it is something that unnecessarily duplicates existing equipment.

I am worried about inventories of equipment that may be less than adequately evaluated serving as a basis for determining that an investigator does or does not need the requested equipment. This is the thing that frightens me and why in considering this recommendation we dismissed the idea of examining total inventories.

Mr. SMITH. I note, too, that Dr. Shannon here on page 10 says:

We do not believe it is practical or useful to attempt to maintain detailed records of equipment purchases by each grantee institution.

I do not understand why there is such a problem here. I think if you were to go to any automobile dealer who operates a purchasing department, you will find he sets up detailed records rather easily.

Dr. SHANNON. I think you are absolutely right when you say an automobile dealer can do it. But, sir, when you realize that we are dealing with 1,100 institutions all over the country of varying sizes, and that each of these institutions, or many of them, are very complex enterprises themselves; that there is common use of equipment, there is intermingling of funds in generally supporting something like half of the medical research, that the keeping of such records would amount to a total inventory of a good share of all the medical research equipment in the entire Nation.

If we are going to use records to determine whether an institution needs a particular instrument, it means we would have to have every substantial instrument in the Nation cataloged; I think this is quite impossible.

Mr. SMITH. I mean, you make a grant, and you know what equipment was under that grant. Now it would not be difficult at all, would it, to have a record, a central record, of the equipment you have given and to what institution?

Dr. SHANNON. That would not be a purposeful record. Because the grantee has instrument requirements, part of which we satisfy and part of which are satisfied by his institution or from other funds. For these to be purposeful we would have to be able to make a judgment that the instrument was or was not necessary for a given purpose. To make that judgment ourselves from a central recordkeeping device, we would have to determine what are the other instruments of comparable nature that are available in that institution for use by

that investigator but which may have come from other sources than NIH.

Mr. SMITH. You at least could look at these records and determine whether or not an applicant has that kind of an instrument from a previous grant, and then determine whether or not that grant expired.

Dr. SHANNON. I think we could do that, yes, sir.

Mr. SMITH. Then at least you would not be duplicating equipment on grant after grant, would you?

Dr. SHANNON. This carries with it the assumption that we do not have concern with equipment at all—and we do with the expensive items of equipment. I am talking now about such things as electron-microscopes and the like. We do not go down, for instance, to such things as telemeters which are in the \$500 to \$600 category, as opposed to those items that are \$10,000 or higher.

The equipment needs are part and parcel of the total request. The study section members who review these are in general well aware of the equipment status of the institution they consider and will, in general, not recommend grants for large equipment items that cannot be justified.

Now I think that this normal review process carried out on a 3- to 4-year basis is adequate to pick up duplication of large items of equipment. Because when a grant extension is requested, or when a supplemental is requested, this is reviewed against a backdrop of the original request.

So I think there are certain automatic controls insofar as large items of equipment are concerned.

Mr. SMITH. Do you ever transfer equipment from one institution that has completed their project to another one starting a new project?

Dr. SHANNON. This is done; yes, sir. I might say further the equipment item under this new form will be more adequately covered than it has in the past.

Dr. ALLEN. This is a thing I would like to comment further on.

As you pointed out, we are putting the responsibility on the investigator now to identify any equipment he is requesting which appears to duplicate existing equipment, and to give us a full explanation.

I think this change is going to go a long way toward meeting the objection you have here.

Mr. GOLDBERG. When you say, Dr. Shannon, that equipment is transferred when no longer needed from one institution to another, how frequently would you say that is done?

Dr. ALLEN. It does not occur very often because as a general rule there is a further need in the grantee institution for the equipment. There is the occasional case, though, when negotiations are undertaken, initiative taken usually as the result of special needs of the investigator who transfers. Arrangements are negotiated with the two institutions concerned in the few cases we have.

Mr. GOLDBERG. I do not think Congressman Smith had in mind the situation where an investigator who had been granted money for the purchase of particular equipment was leaving to take his project elsewhere. I think, if I am correct, what he had in mind is the situation where you are supporting a 2- or 3-year project that is completed and there is some fairly substantial permanent equipment. Is it your

policy to make that equipment available elsewhere in connection with new projects requiring the same type of equipment, or do you pretty much forget about it on the assumption it will serve a useful purpose in the institution where the completed research was performed?

Dr. ALLEN. We do the latter, particularly in view of the fact that the equipment purchased in the training grants and research grants is often interchangeable and becomes an asset to the institution. We have often said, right or wrong, that one of the fine things about the grants program is that if it were suddenly to end we still would have equipped university people to do some limited research since the equipment would still be there to facilitate their teaching and to provide for some research.

Mr. SMITH. What about your grants to commercial firms? Do you leave it there, too?

Dr. ALLEN. We now retain the title to equipment purchased by commercial firms under grants. This is a recent change in our policy. The grant programs to commercial firms have been so limited that, until just recently, we have not developed different procedure.

Mr. SMITH. When the grant expires, then what do you do with the equipment?

Dr. ALLEN. The equipment then becomes available to other grantees. Since this is a very recent change in procedure, I would like to tell you what we will do in the future. We will explore possible uses for such equipment in universities.

Mr. SMITH. Then you will have to catalog the equipment?

Dr. ALLEN. That type; yes.

Dr. SHANNON. These will not be grants, these will be contracts with commercial organizations which are much more specific in terms of the detail and in terms of describing what the performance would be. This then becomes a very simple problem.

Furthermore, I would say up until about 3 years ago, we really did not make any grants to commercial institutions so that our experience with commercial institutions (1) is short in time and (2) very low in volume, almost to the point where this presents no problem. It is possible to keep the total needs here in a very small card file. I think, actually, what we would do, we would turn this mechanism over to the cancer chemotherapy people to carry this on as a service. They are in a fairly close contract relationship with industry.

Mr. GOLDBERG. Do I understand correctly that you will rely under the new arrangement exclusively on the revised form for detecting whether or not an institution has equipment similar to that being requested?

Dr. ALLEN. No; that is just part of what will be done. The budget analyst that I mentioned will have access to the expenditure reports and to the previous applications, and it will be his job to examine both what the man says in the application and what our record shows.

Mr. GOLDBERG. Then, in effect, you are going to be maintaining a type of record system, except that you will go back to the individual grant applications of prior periods instead of to a card file.

Dr. ALLEN. For that part of the equipment that we have provided; yes, sir.

Mr. GOLDBERG. Actually, when the committee made its recommendations for the need and advisability of having usable equipment records,

it did not have in mind any elegant management device. Rather, it recognized that there was a need, and probably this need could be filled in some reasonably easy form. What motivated that recommendation was the kind of finding which appears on page 39 of the committee's report, dealing in this case with grants to a commercial firm. In this particular case the same study section was involved in both grants, but no one at NIH had the responsibility of knowing, when the second grant application was acted upon, that NIH had already made available to that commercial firm calculating machines, a typewriter, an adding machine, desks, chairs, tables, file cabinets, and so on. A second application was submitted for a new but related project, and the firm asked for and was allowed all of the same things again. If you had maintained even a primitive equipment file, it would have disclosed that they already had these things and you might have inquired why they needed them a second time.

It is that kind of situation which led the committee to conclude, without specifying the kind of system required, that there should be some practicable equipment record system which will enable your analysts to know that certain types and quantities of equipment were purchased by a given firm or by a given department or division of an institution from earlier grants. I would readily grant that the problem becomes a more complicated one with respect to a large institution or when you are dealing with equipment which may be modified in the course of its use. But when you are dealing with durable office or laboratory equipment, even though this may not be a huge item in your budget, it is a manageable task to know what has been done and whether or not these items ought to be around and available for subsequent projects.

Dr. ALLEN. I believe, though, you would agree that our change to the new procedure described in our report to the committee goes a long way toward accomplishing what you have in mind.

Mr. SMITH. Some of these examples can hold a whole research program in disrepute before the Congress.

Dr. ALLEN. That is right.

Mr. FOUNTAIN. I think everyone in Congress, as has been repeatedly demonstrated, is very much interested in the type of work you are doing.

In connection with what has just been said, I think for the record it should be made clear that your discussion in this report deals with the problem of maintaining detailed records, while our committee report is concerned with what we call usable records. In fact, our report states on page 40, and I quote:

Duplication of equipment and needless spending are possible because the Division of Research Grants has neither the controls nor the personnel to prevent their occurrence. The Division does not maintain usable records, for the purpose of evaluating requests, of the permanent equipment and supplies already in an applicant's possession from previous grants, and it neglects also to make adequate and systematic inquiry as to whether or not requested items are actually needed and reasonably priced. Without proper management safeguards, waste and extravagance are inevitable. Accordingly, the committee strongly urges that immediate action be taken to correct these shortcomings.

The question, therefore, is what kind of record system do you plan to adopt for this purpose?



Dr. ALLEN. Except for the decisions we have already reached in connection with the new procedure described we have not finally resolved this question. We recognize the problem and are going to move ahead.

Mr. FOUNTAIN. Actually the budgetary review procedures discussed at the top of page 2 of your document require usable equipment records.

Dr. SHANNON. I would say the biggest safeguard for this purpose will derive from the decisions we have already reached relating to this type of information, together with the undertaking of negotiations of these grants rather than depending solely upon studies. And I would suspect that a combination of these two will constitute a most important safeguard, quite apart from any other recommendation.

Mr. GOLDBERG. This certainly would seem reasonable, Dr. Shannon, as long as your budget analysts have available some kind of machinery to work with. Casually speaking, I doubt that you would have a workable system if it were necessary to pull the application files in every case, to go back to see what these people got. What the best answer might be I am certainly in no position to suggest, but it does seem feasible to have some kind of a tickler file where you would have an immediate record of the equipment that went into a department of an institution in the last several years. This information would serve as a basis for determining what present use is being made of that equipment and whether it could be used for the new project. I have nothing more elaborate than that in mind.

Mr. FOUNTAIN. I note at the bottom of page 2 of your response to the committee's recommendations that NIH has set up a task force—and you discussed it this morning—to explore further the feasibility of using field review teams. This action, of course, is in keeping with the subcommittee's recommendation that such an arrangement be considered to strengthen grant administration. We will watch this with quite a bit of interest.

Page 3 of the summary indicates that NIH has established a special advisory group for large grants which provide support for whole programs of institutions. The supplement to your policy statement (attachment II) classifies these projects as program-project grants and center grants. Will the large grants which NIH makes to such institutions as Sloan-Kettering and the Children's Cancer Research Foundation be classified as program-project grants under your new review arrangement?

Dr. SHANNON. Well, it is interesting that you mention Memorial Hospital because we had Dr. Heller, who is the former Director of the National Cancer Institute and who is now president of the center, together with the entire top management team of the Memorial Center to discuss precisely how we can handle in a more businesslike fashion the NIH relationship to an aggregate of funds for that organization involving \$9.5 million for research, approximately \$4 million of which comes from the Federal Government. They are going to make certain proposals. We in turn will make certain proposals to them. I think this is typical of the most complex of our administrative relation to any given institution, because we support many elements in the Memorial program. This is the largest individual cancer center in the United States or in the world. As a



matter of fact, it is considerably larger than our own direct operation in the National Cancer Institute. It presently operates in four geographical areas. They have a large building program. It has a broad affiliation with the Cornell, N.Y., Hospital Medical Center and operates three corporate entities that are responsible to the board of trustees and the Memorial Center. One of these is the Sloan-Kettering Institute and the other the Ewing Hospital. The Ewing Hospital is a further complication of the overall enterprise in that this is supported also by New York City.

So in other large grants our problem will be considerably simpler than is the case for the Memorial Center. In any case, however, our reviews of large grants will involve the administrative people or the institution as well as the scientists. These will all have to participate in the negotiations. Also the total program will have to be considered, rather than these elements of the total program which we support.

So, Mr. Chairman, all I can say is that one reason for expanding the review process is to encompass inquiries directed toward those who have responsibility for the direction of research as well as those who have experience in straightforward fiscal matters, because we are getting into an area of very broad complexity at the present time and, quite frankly, sir, we have little experience with this type of thing.

I think what we have to do is to take each case as it comes, and then profit by our experience and be quite willing to retrace our steps. In each case we fully accept with the institution concerned that the device that has been established initially is an experimental device.

In a somewhat similar way we had negotiations with the top leadership at Cal Tech. Two years ago a grant of \$500,000 was made available to the division of biology of the institution on a more or less continuing basis. This represents about 40 percent of the total support of that division.

This is one of the larger divisions. It is one of the outstanding scientific institutions in the country. Somewhat similarly we have joined with the National Science Foundation and the Air Force to support a very broad endeavor in communication sciences at MIT which goes all the way from central service systems right down to the practicalities of putting so many messages on the wire.

These are interrelated in the same mathematical problems. In this latter case the grant was negotiated with Dr. Stratton who is chancellor of MIT. In the case of Cal Tech the negotiation involved Dr. DuBridge who is the president of Cal Tech.

But, Mr. Chairman, to say the things we have worked out so far will obtain in the future will be to show too much confidence in our ability to foresee the future. We have to face up to a totally different situation when our support is concerned with a substantial part of the total operations of an institution as opposed to the support of an individual investigator.

I think we made the decision that when a grant is in the range of \$100,000, it begins to impinge upon institutional policy and no longer can be handled within a simple framework as science but must involve institutional considerations.

So our experience in this area is limited to about 15 months. Most of our experience is limited to, I would say, the last 6 to 9 months. I think we appreciate the complications, and I think the institutions themselves appreciate that they are in a wholly new area of support which they wish to approach quite differently than they did during World War II.

In AEC and the Department of Defense they approach problems of this sort by setting up separate research institutes that are somewhat apart from the institution of higher learning itself. We feel, as do the institutions, that our programs are so much a part of the total institutional activity that they should be built into the aims and objectives of the institution.

This is a much more complicated thing than total support of a research institute type activity such as done by the defense agencies.

So I would say, Mr. Chairman, that this problem has occupied a great deal of our time and thought and will continue to occupy a great deal of both before we feel we have worked out the best framework for smooth action.

Mr. FOUNTAIN. Dr. Goldberg.

Mr. GOLDBERG. Dr. Shannon, do you have management competence as well as scientific competence represented on the special advisory groups that are reviewing the large institutional grants? Can you give us some idea of the composition of this new type of advisory group?

Dr. ALLEN. I think Dr. Lindsay can provide the names, but I can point out that there are associate deans and other management people such as comptrollers, who are serving on these committees.

We have talked in terms of bringing legal talent on also, or at least have such competency available for the ad hoc situation where it would be required. We will run into a few situations involving legal problems.

Mr. GOLDBERG. Then you have broadened it considerably from the normal composition of a study section?

Dr. ALLEN. That is right.

Mr. FOUNTAIN. My next question is really a policy question, which, as you know, is of concern to the committee and the Congress. Will the special review panels consider the basic question of how large a proportion of an institution's total budget NIH can properly and prudently finance?

Dr. ALLEN. Actually, that was the main part of your discussion just yesterday, Dr. Shannon, with Sloan-Kettering, was it not? One of the central questions was what percentage of the total operations should NIH or the Federal Government support. The management people on the committees will have this question as one of their primary concerns when they go into examining a large, broad program project.

Mr. GOLDBERG. Are you thinking in terms of making these decisions on a case-by-case basis, or might it be practical to set up some guidelines indicating at what point it might become hazardous for NIH to underwrite the total operations of an institution without participating in its internal management decisions?

Dr. SHANNON. I would say that we do not know how to write such a guideline now. I think out of these preliminary discussions will

come the information that perhaps will permit the formulation of general guidelines. But at this point we feel we have to take a look at different types of institutions to find out the program impact and to consider a variety of situations. Again, much of the discussion with the Sloan-Kettering people had to do with the eventuality that an advisory group serving for us might disagree with the advisory groups serving for the institution relative to certain program segments that the institution wishes to support, and we in turn felt we could not.

Now these are very serious questions because I think that, in my mind, we should never put ourselves in a position of supporting research to an extent that program determination for a total institution derives from actions by a central group in Bethesda. Thus we have to consider the limits on the extent to which we contribute to an institution, how far one can and should go in supporting the total activity, and yet not be a party to the local final determination as to what the future of this institution will be.

This is going to be a very difficult problem, and I think, quite frankly, that had we not a background of some 16 years now in dealing with these institutions and dealing in matters where they fully appreciate that our best interests are served if their best interests are served—that were it not for this environment—we just could not undertake these negotiations at all. I would rather not at this point in time predict how far we can go in making these types of determinations.

Mr. GOLDBERG. When the Federal participation in the operating budget of a private nonprofit institution becomes substantial, especially when it approaches or exceeds 50 percent, one inevitably gets into sticky questions relating to the regulation of pay scales and the like. In effect the supported institutions begin competing with Government for scarce talent with Government paying a sizable share of the cost of recruiting personnel from Government.

This gets to be pretty tricky. I know there are groups around town that are concerned with this very problem, not only in your area but even more particularly in the defense area.

Mr. FOUNTAIN. I have no further questions at the present time in connection with NIH actions and attitudes toward the first recommendation in the committee report.

Are there questions?

Mrs. DWYER. No questions.

Mr. SMITH. I have one question.

Mr. FOUNTAIN. Mr. Smith.

Mr. SMITH. Dr. Shannon, see if this is a fair statement. I detected a sort of a central theme in your presentation which seemed to be that the success or failure or the degree of success of these research projects is dependent quite largely upon the particular scientists that happen to be exploring the possibilities.

Dr. SHANNON. I would say very largely, yes, sir. A particular scientist and the extent to which he has support so that he has the ability to pursue those paths that would appear to him to be open and warranted for study.

Mr. SMITH. Then in connection with this, in making your contracts with commercial firms, do you determine in advance what scientists they will be using?

Dr. SHANNON. We would not approach contracts with commercial firms, in this area of science we are discussing now, on such a management review basis. Rather the scientist concerned would apply to us for support with the concurrence of his top management, and after their determination of the time he will make available and the resources to be provided him. The main difference between handling the commercial scientist and handling the scientist in the university would be the document that implements the support. In the case of the scientist in industry, this would be implemented by a contract which can spell out specifically terms and requirements and in the case of the university investigator would be much looser, more general support in the form of a grant.

Now in certain areas where we do industrial contracting of the type we do in running the large screening programs of cancer chemotherapy, we seek out top management in the chemical and pharmaceutical industry, to ascertain their willingness and capability of undertaking specified work for us. This is precisely the same as is done in any defense contract. After they have determined their willingness and capabilities from a management standpoint, then we secondarily look at the scientific talent they have to pursue the problem.

Mr. SMITH. Do you then detail what scientific talent they will be using?

Dr. SHANNON. This is agreed generally by contract, yes, sir.

Mr. SMITH. So they cannot substitute a lower echelon of talent?

Dr. SHANNON. This is generally correct, yes, sir.

Mr. FOUNTAIN. Now to recommendation No. 2 of the committee.

***Recommendation No. 2—Grants for projects initiated by commercial firms be placed on a cost-sharing basis***

The committee believes this action, together with implementation of its recommendations for strengthening the review of projects and the management of grants, will place grants to commercial firms on a sounder foundation (p. 46).

***NIH action***

A task force has examined the comparative advantages and disadvantages of various grant and contract mechanisms for providing support of investigators located in commercial firms. The tentative conclusion has been reached that negotiated contracts represent the preferable mechanism for such research support. This group is now exploring the feasibility of negotiating contracts with the commercial firms which now have grants from NIH. This involves review of the type of work now being supported and assessment of the general terms and conditions most suitable for such contractual relationships.

Mr. FOUNTAIN. You report that a task force has examined the comparative advantages of using grants and contracts for supporting investigators in commercial firms, and that it has reached the tentative conclusion that negotiated contracts represent the preferable mechanism. How do you plan to handle the payment of indirect cost in connection with research supported through contracts?

Dr. ALLEN. At the moment, since we have the 15 percent ceiling on research grants, and since the contracts will be paid from the same source as the grants, we would feel obligated to provide no more than a 15 percent indirect cost allowance. The scientist would have to get permission from his top management to contract under those terms. We have had a number of cases where, when we described our indirect cost policy, the application for support was withdrawn.



Mr. FOUNTAIN. As I recall, it was the committee's view that the same rate should apply to all nondirected research support in a given institution regardless of whether it was financed by grant or by contract.

What arrangements has NIH made for the disposition of permanent equipment purchased by commercial firms from grant funds? Perhaps that question has already been asked.

Dr. ALLEN. Yes, and I answered that we are just now facing the question. I can tell you that it will be our plan to find an appropriate use for such equipment, probably in a university. I think we have the authority.

Mr. FOUNTAIN. Any questions on recommendation No. 2 or on NIH's response?

Recommendation No. 3.

*Recommendation No. 3—NIH develop a separate policy governing the purpose and use of, and the eligibility conditions for, grants to help support national and international meetings of recognized scientific organizations (p. 42)*

#### *NIH action*

NIH agrees with the recommendation that "policies and procedures designed for support of scientific investigation should not be applied to conference grants." A revised statement of policy and procedures under which NIH grant funds may be used for the support of scientific meetings has been released. This revised policy specifically prohibits the use of grants funds for (1) indirect costs, (2) honoraria in connection with such meetings, and (3) purchase of equipment. It also provides for much more detailed breakdown of proposed expenditures and forbids the transfer of funds from one category of expense to another without PHS approval. (See attachment III.)

Mr. FOUNTAIN. Personally, I am pleased to see that NIH has responded to the committee's third recommendation by issuing a specific policy statement governing support for national and international meetings of recognized scientific organizations. I might add that conferences and meetings run into quite a bit of controversy on the floor of the House in all areas of Government, particularly when they relate to entertainment, as I am sure you gentlemen are aware.

I have examined your attachment III for this purpose, and it seems to me that it goes a long way toward meeting the committee's criticisms. However, the subcommittee will certainly want to observe, as I know you will, how these new ground rules operate in practice before it can form an opinion as to whether or not they are adequate to prevent the disturbing abuses which have occurred in this grant area.

I might observe that a number of people have asked me why the Federal Government should contribute at all to the financial support of conferences when their sponsors have money available for substantial entertaining. How would you answer that question, Dr. Shannon?

Dr. SHANNON. I think I would answer it this way, that in the aggregate, taking conferences in general, there is very little money available for entertainment and very little money spent from any source. What highlights the problem is the very occasional occurrence, such as happened in one of our own grants, where funds are misused and that casts a shadow over the entire procedure.



Now, on the other hand, there are certain elements of entertainment that are absolutely essential for the successful conduct of a conference. For instance, when we invite to this country a number of people from other countries, there are certain receptions, certain dinners, certain matters of hospitality that a host would normally provide for his visitors that we would consider to be an absolute essential in contributing to the total net function that is performed. We feel such essential amenities are a very normal conference expense. On the other hand, being under control, we have never permitted knowingly the expenditure of any of our dollars for such a purpose, and these funds are derived elsewhere. So I would say that, and if I could say this off the record—

Mr. FOUNTAIN. Off the record.

(Off the record discussion.)

Dr. SHANNON. And picking up on the record—that there are certain very legitimate and certainly essential expenses of entertainment sort that go into the official actions of a host group in running a suitable conference. The extent of these are usually small in terms of the total cost of the conference.

Now I think that this in part answers the second part of the question as to why should we be concerned with the support of conferences when there is enough money available for entertainment.

We have a primary responsibility to support quite broadly programs of scientific communication. Conferences, whether they be small or large, whether they be regional or international, have developed to be a very essential part of the complexities of present-day science and probably one of the very effective means of scientific communications. We feel it does little good to provide the wherewithal for the acquisition of new knowledge if at the same time we do not facilitate its transmission to other scientists. So we have a deep concern to see that transmission of science takes place as effectively as possible and at the earliest possible date.

Our support of conferences in general, in terms of large dollar costs, relates primarily to this problem of communication. It relates to travel costs of scientists, particularly in international meetings; it relates to the costs of the organizing and conduct of the conference, and it relates to the publication of the results of the conference. I would say if you broke the total expenses of conferences down, this is where the bulk of our funds would come in. Now in general, with science as it is today, these conference groups that start as aggregations of interested scientists have nowhere to turn for such expenses, and yet they are an essential part of the support of science. So I would say that, putting aside the unfortunate occasion of misuse of funds for entertainment, that we have a deep obligation to support conferences.

The guidelines were adequate, but our administration of them was perhaps not adequate. I think both of these have been taken care of in the proposed action.

Now, Mr. Chairman, I too will watch the development action under these new guidelines. In part because I want to assure myself that the new guidelines are used with serious consideration of the Federal dollar and, also, I want to watch to make sure we have not been too restrictive in certain areas. One area in particular relates to our

unwillingness to have any more NIH funds used for the payment of honoraria. A symposium will quite frequently require the work of an individual over and above his job, for several months, to develop the background of information upon which a working conference will be based.

Now, in your new guidelines, we have said these funds must come from some other place, they cannot be provided by us. But I am not sure that this was a wise decision. But in modifying our previous guidelines we would prefer to be overrestrictive and then relax, than to go part of the way and then find in a year we have to be more restrictive.

We will sharpen up these problems more by saying, "No, we cannot do that" than if we allowed certain items and then tried to assess their importance. In this way the impact of this restriction will be abundantly clear very early.

Mr. FOUNTAIN. In addition to this committee which has jurisdiction over Federal agencies with respect to efficiency and economy, we have in the House, what the newspapers have described as a third party—the Economy Party of Mr. Gross and Mr. Hoffman. I asked that question in part so that the record might show your explanation concerning entertainment, which they discuss quite a bit on the floor of the House. And I think they serve a very useful purpose in doing so, regardless of the fact that I think the Congress realizes we must have conferences and there must be some form of entertainment.

Mr. GOLDBERG. In connection with the payment of honoraria which you have now excluded from your conference support, but which I believe you still permit in connection with some symposia—

Dr. ALLEN. No, sir.

Mr. GOLDBERG. Then honoraria may no longer be paid to scientists who participate in symposia sponsored by study sections as well as in connection with conference grants? I am sorry, I misunderstood that.

Dr. SHANNON. As I say, we have been very restrictive and we may have to step back.

Mr. GOLDBERG. I might just observe in this connection that the subcommittee is presently undertaking a review of the report issued recently by the Advisory Commission on Intergovernmental Relations dealing with the subject of governmental structure and organization in metropolitan areas. The subcommittee has invited the participation in this project of 20 outstanding political scientists who appear to be very enthusiastically accepting this invitation with no offer of compensation of any kind for the preparation of papers.

This raises, I think, the interesting question of whether it is necessary, when NIH is giving an individual the opportunity to make a contribution in the field in which he has a very deep interest, to offer him remuneration other than the actual expenses of attending a scientific meeting.

I know you have been doing it in the past, and I find it interesting that you are now eliminating it.

Mr. FOUNTAIN. Any further questions in connection with the committee's recommendation No. 3 and the NIH response?

If not, we will go on to recommendation No. 4.

**Recommendation No. 4**—*NIH seeks to further improve its methods for coordinating research activities with other Government and private agencies so as to minimize unnecessary or unintended duplication of research in the health field (p. 49)*

**NIH action**

The report states, "NIH has developed workable arrangements for avoiding undesirable duplication of project support." NIH has taken additional steps to improve the information exchange system with other Federal agencies. Data on NIH intramural research projects are now being made available to the Science Information Exchange. In this connection, it should also be noted that NIH helped found, and has long been a strong supporter of the Science Information Exchange (formerly the Biosciences Information Exchange), and we attempt to utilize these facilities to the maximum. Continued attention is being given to means for improving coordination and facilitating communication among Federal agencies engaged in biomedical research.

Mr. FOUNTAIN. With respect to recommendation No. 4 and your response, Dr. Shannon, would you describe what additional steps have been taken to improve the exchange of information with other Federal agencies?

Dr. ALLEN. Since the report was issued, we have not done anything further. We have worked diligently on this problem, as we stated in our interim report. Dr. Shannon referred earlier to the fact that we had actually created ourselves at NIH the clearinghouse which eventually resulted in the Science Information Exchange. The only thing we are able to say at this point is that we accept without any sort of quarrel that continuing action is needed in this area and that we will be alert to the need for improvement.

I might add that we recognize that we should continue to improve our relationships with the other Government agencies and with the outside agencies, and that we will continue to watch for ways and means to do so. We have not, since receiving your report, determined a way to improve. On the other hand, we have actually recognized this obligation since the early days and have worked continuously to try to maintain good relationship.

Mr. FOUNTAIN. Are you now fully reporting your intramural projects to the Science Information Exchange?

Dr. ALLEN. Yes, as Dr. Shannon mentioned in his prepared statement.

Dr. SHANNON. Mr. Chairman, I would like to point out that this so-called informal exchange of information really goes beyond what these terms ordinarily carry in their connotation. I would like to give two examples of what I have in mind. Periodically we have invited the AEC to come with their top management, and discuss their total training program against the backdrop of our total training program.

This serves as a basis of certain general decisions as to what we should do and what they should do. This is a type of continuing relationship that we have.

Just last week, or 2 weeks ago, I was in the receipt of the projected research program of the Army. General Forsee, who was in charge of research and development for the Office of the Surgeon General of the Army, sent to me 2 weeks ago his projected 5-year program, and then last week came with his top staff and discussed with my top staff

the interrelations of the two programs in order that we would be fully aware of their program and they in turn would be fully aware of any overlap or duplication that could be avoided. This exchange resulted in very frank discussions against a backdrop of a formal document that he had already presented to the Surgeon General of the Army and to the technical people, I believe, of the DOD.

Within the past week we met with Dr. Cannon, Chairman of the National Research Council's Division of Medical Sciences, to discuss at some length with him the extent to which the NRC, National Research Council, would serve as a focus for exchange and dissemination of scientific information, not only within the Government, but more importantly between Government scientists and those scientists outside the Government, and between scientists outside of Government with themselves.

We are involved in this type of activity continually. When we say we have informal relations, what we mean is there is no one committee set up within the executive branches that formally has this responsibility, and outside the framework of a specific committee we do undertake very serious program discussions with each of the agencies that have a large stake in biology and medicine.

I think this goes far beyond the more obvious form of communication represented by attendance at our study sections and council meetings of representatives of the other services. What I have spoken of are basically planning sessions. Perhaps they should be formalized, I do not know. All I can say, sir, is, informally they operate very effectively and we have a sense of full awareness, not only of what the AEC and the Army and Agriculture and the like are doing, but what they are projecting for the future and we make our plans accordingly.

Mr. FOUNTAIN. Off the record.

(Discussion off the record.)

Mr. FOUNTAIN. The subcommittee stands recessed until tomorrow at 10 a.m.

(Whereupon, at 12:30 p.m., the subcommittee recessed, to reconvene at 10 a.m., on Wednesday, August 2, 1961.)

## HEALTH RESEARCH AND TRAINING

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WEDNESDAY, AUGUST 2, 1961

HOUSE OF REPRESENTATIVES,  
INTERGOVERNMENTAL RELATIONS SUBCOMMITTEE,  
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,  
Washington, D.C.

The subcommittee met, pursuant to recess, at 10:05 a.m., in room 100-B, George Washington Inn, Hon. L. H. Fountain (chairman of the subcommittee) presiding.

Present: Representatives L. H. Fountain (presiding), Neal Smith, and Florence P. Dwyer.

Also present: Dr. D. C. Goldberg, professional staff member.

Mr. FOUNTAIN. Let the subcommittee come to order and the record show that a quorum is present for the purpose of taking testimony.

I believe we had reached recommendation No. 5, Dr. Shannon, when we recessed.

*Recommendation No. 5—The President establish a uniform policy with respect to acceptable salary practices in the use of Federal research funds applicable to all Federal agencies making grants to educational and other research institutions (p. 48)*

### **NIH action**

The NIH heartily endorses this recommendation and advocates the establishment of an interagency committee under the aegis of the Federal Council on Science and Technology or a special group under the President's Science Advisory Committee to study the problem in its total setting and to recommend uniform policies to be utilized by national agencies for the President's consideration.

Mr. FOUNTAIN. Your summary indicates that NIH heartily endorses the committee's recommendation for a uniform policy governing acceptable salary practices in the use of Federal research funds. It states further that NIH advocates the establishment of an interagency committee under the Federal Council on Science and Technology or a special group under the President's Science Advisory Committee to develop such uniform policies.

What action has your agency taken, if any, to communicate this position to the President?



FURTHER STATEMENT OF DR. JAMES A. SHANNON, DIRECTOR, NATIONAL INSTITUTES OF HEALTH; ACCOMPANIED BY DR. DAVID E. PRICE, DEPUTY DIRECTOR; DR. ERNEST M. ALLEN, ASSOCIATE DIRECTOR FOR RESEARCH GRANTS; DR. DALE R. LINDSAY, CHIEF, DIVISION OF RESEARCH GRANTS; AND JOSEPH S. MURTAUGH, CHIEF, OFFICE OF PROGRAM PLANNING

Dr. SHANNON. Mr. Chairman, we have taken no positive action of a formal nature at the present time. We have just discussed this informally in the Office of the Surgeon General. We will take action later in the summer.

I might say that a good deal of our time, quite frankly, sir, during the past month or two, and a good deal of the time of the Surgeon General's Office, has been taken up with problems of new legislation and appropriation. We feel that after we get out of these phases of our program activity it will be a suitable time.

The other reason for delaying it is both the Federal Council and the President's Science Advisory Committee have a less active program during the summer months. We feel this is of sufficient importance that this should be considered by the total committees concerned and not such parts of the committee, due to vacations and what not, who may be available during the summer months.

Now the reason why we propose this action rather than attempting to take independent action is that this is a very complicated problem that goes into all actions of Government in the fields of research and development. When one looks at the broad scope of research and development, or if you take our total programs in terms of all programs supported in this field, we are only about 5 percent of the total. On the other hand, if you take scientists who are engaged, then we are substantially more than 5 percent because our costs do not include the large capital outlay for test development. I am thinking now of missiles, aircraft, and things of that sort.

So we have a stake out of all proportion to the dollars expended in research and development, but still we are only a minor part of the total problem. Quite frankly, sir, I have not the wisdom to have thought this problem through to the point of having simple devices to accomplish the objectives we seek.

We will look to help from other agencies who have thought about this problem, and hope that among the various groups we can come out with proposals that are realistic.

Mr. FOUNTAIN. It will require some coordination.

Dr. SHANNON. Yes, sir.

Mr. FOUNTAIN. Any questions on recommendation No. 5?

Mr. SMITH. No.

Mr. FOUNTAIN. Dr. Goldberg?

Mr. GOLDBERG. No, sir.

Mr. FOUNTAIN. Now recommendation No. 6.

*Recommendation No. 6—NIH initiate for a limited time a special developmental type grant as a direct means of stimulating research capability in those universities and professional schools which have training responsibilities in scientific fields related to health, but are not actively engaged in health research (p. 32)*

#### **NIH action**

The number of universities receiving NIH grant support is growing steadily. Between 1957 and 1960 the number of colleges and universities receiving research grants through NIH grew from 209 to 293—an increase of 40 percent. The number of institutions receiving support grew in the same period from 572 to 973, an increase of 70 percent.

With respect to the few institutions not now participating in the NIH research program, the Fountain committee report indicates that the so-called limited participation is "due more to the paucity of project applications than to the high disapproval rate of proposals." While this observation applies generally to academic institutions as a whole, NIH is keenly sensitive to the need for developing research potential in health professional schools such as veterinary medicine, pharmacy, nursing, and social work. The NIH believes that the general research support grant, when fully implemented, will in large measure serve the purpose sought by the committee.

With respect to the larger issue raised by the committee's recommendation, it should be emphasized that scientific merit—the criterion of excellence—governs today's decisions to support research. This criterion assures support for the brilliant, young innovators as well as the mature investigators. Diversion of research funds from the talented to the mediocre would be a poor investment of public moneys both in the short run and over the long-haul. No Federal agency now has a clear statutory role either to facilitate the upgrading of weaker institutions or to foster the creation of new universities. This may be a serious gap in national policy.

Mr. FOUNTAIN. The committee made its recommendation for a temporary developmental-type grant because of the surprising evidence that a substantial number of sizable universities and some professional schools in the health fields are receiving apparently only very small amounts of NIH research money.

The NIH response to this recommendation appears to wish away the problem by relying on institutional grants to do the job. Personally, I have some doubt that the institutional grant program authorized by Public Law 86-798 can be used constructively to encourage health research in these relatively inactive institutions.

Your testimony yesterday, Dr. Shannon, appears to support this view. Your prepared statement on page 14 indicates that the contemplated extension of the institutional grant program to academic institutions other than medical, dental, osteopathic, and public health schools will be limited to institutions which already have substantial research programs supported by NIH.

The need, as I believe the committee saw it, is not just for NIH to distribute money, but to take the initiative in ascertaining why these particular schools are doing little and what kind of stimulation, if any, would be helpful in individual cases. There is no suggestion or intent in our report that funds be diverted "from the talented to the

mediocre." We are concerned rather that your normal operating procedures may possibly be overlooking talent which could be used with a little technical assistance or advice.

In this connection I would like to ask you, does either NIH or the Public Health Service have personnel visiting universities for the purpose of stimulating the submission of research applications? How far that practice should go I do not know.

Dr. SHANNON. Yes, sir. Mr. Chairman, I would like to comment on this a little bit more generally. What I would like to do first is to divide institutions that are engaged in, or are potential doers, of research into several groups. Because research support, as the committee well realizes, comes not only from us, but from a variety of sources.

In the first place, we have the professional schools that have as their primary concern the medical sciences, the medical related sciences. These are schools of medicine, osteopathy, dentistry, and schools of public health.

In a second category we have hospitals, we call them affiliated hospitals, that are separate from but related to the academic institutions we just mentioned.

Then there is the so-called nonaffiliated hospitals.

Then there are the schools, professional schools, that have relation to medicine but are not large contributors such as schools of veterinary medicine and nursing. Included here are the schools of social science, or divisions of social science within universities concerned with the behavioral sciences and the impact of social and economic factors on disease.

Then finally you have the independent research institutions.

In the schools that have professional responsibility for the development of health personnel NIH has a continuing and vigorous contact relative to their total program through a series of training grants that are made primarily to facilitate the development of knowledge within the student body of special areas of disease that has special significance.

I have in mind particularly cancer, heart, and mental health. Each of the schools in this initial group receives grants amounting to \$25,000 per school from each of these categorical institutes.

Now organizationally the directors of these categorical programs in each of these schools meet annually, with themselves and with our people, to discuss progress in the field, discuss our programs, and their needs. I think we have a very close liaison with them. These programs have very definitely contributed to the development of sound teaching programs in their respective categorical areas.

This is quite apart from visits which I will come to later.

In the affiliated hospitals there is no such formal relationship. Although we consider them as a separate group organizationally, their activities are so related to the parent institution with which they are affiliated that, functionally, they really are part of the school. So that in terms of our activities they do not require separate entity.

The nonaffiliated hospitals formed an association, as of, I would say, 3 years ago, and they have national meetings. We have sent people to the national meetings where directors of each of these major

nonaffiliated hospitals meet. If anything, sir, I think we have been overstimulatory in respect to this group. The net result has been, as I see it from my office, an expectation on the parts of certain of those institutions of possible participation of NIH programs in the solution of their problems beyond our capabilities or beyond the realm of desirability.

We have had discussions with executive committees of this group in an attempt to sort out just what role we can play in terms of professional development in certain of these areas. A series of grants are being made now that are the result of very positive and very direct stimulation on our part.

I might say, sir, this has caused more than a small amount of administrative headache, but this I do not mind at all because, on balance, a net good has been achieved. We are dealing here with a group of hospitals with very large clinical resources, with very energetic staffs, but hospitals in the aggregate which did not have the scientific competence that is generally associated with the affiliated hospitals.

I might say the Heart Institute has been particularly active in this area.

Now in the schools of nursing, schools of veterinary medicine, and schools of social science, we have had contact there primarily through the professional associations that represent the professional activities of the schools on a national basis. I have had, for example, during the past year in terms of veterinary schools a series of conferences with the leadership of the American Veterinary Association from the standpoint of what can be done on their part to upgrade the professional competence of the schools of veterinary medicine and what can we do on our part to facilitate this. Now this is a very important area of medical science because certain diseases are interchangeable between the human and the veterinary host.

Experimental animals are at the crux of most major advances in medicine. Quite apart from that, many animals serve as reservoirs of disease or as vectors that have the capability of transmitting disease to an extent that veterinary science is of very serious concern to those who would advance scientific knowledge on human immunity in respect to disease.

I would say traditionally the veterinary scientists have contributed greatly to our advancement of knowledge.

So I think in the aggregate we are making a substantial contribution to the research development of the veterinary schools.

In a somewhat similar way for nursing schools the National Advisory Health Council has had a subcommittee that considered problems of research by schools in this area extending, I would say, over a period of about 3 years beginning in 1958 and going through 1959 and 1960.

They had extensive discussions with the hierarchy within the major schools and within the professional associations related to their activity. Research of a medical nature, that is medical and biological research, within the profession of nursing is a thing that has been very difficult to stimulate and very difficult to accomplish. But I would say, and Dr. Allen may correct me, that after 4 or 5 years we do have the nucleus of a program that is both suited to the professionals



in that area and of a sufficiently high quality that we are very proud to support it. This is small. However, taking nursing in general, and the service relationship of the nurse to the needs of the physician, perhaps it should be small in relation to the total.

Now in some of the more advanced divisions of social science within our universities or some of the schools as such, they have been already very heavily involved in health research, particularly in areas of mental health.

These sciences are becoming increasingly important to all areas of medicine and we have undertaken discussions during the past 2 years as to what we should do in those areas of behavioral sciences that have capability of developing information that is peculiarly relevant to our problems in medicine and yet is not particularly relevant to problems of the emergence of mental illness. Most of our studies in this area have been directly in relation to, for example, the family problems that surround the emergence of the mentally ill and problems of emotional development of a child insofar as this relates to the development of mental aberrations during late adolescence or early adulthood.

In fact, in the schools of social science and university divisions of social science, we normally support research and we have fairly broad training programs.

So I think at the present time we have very broad contact, either directly with these schools where the bulk of research would logically be expected to be initiated, or through the professional groups that satisfy the professional needs.

Now there is another group that we have not had official contact with on an organized basis. These are the schools of arts and sciences in the universities that are university oriented rather than medically oriented, but nonetheless which have the broad capability of contributing to research in certain of our health problems.

These groups have not been approached as professional groups. Now I have in mind the departments of physics, departments of chemistry, departments of mathematics and things of this sort. On the other hand, we have in a very positive way, via study section apparatus, inquired into the capabilities of these groups, stimulated them, quite frankly, sir, to divert their attention from the physical sciences to those activities we think of as at least equally important, human welfare.

And we have done this in a series of very formal ways, and I would like to discuss one of those ways in which we have done it.

It became apparent to us in our periodic review of the substantive content of our programs that biophysics, physical biology, or a combination of physics, chemistry, and mathematics, had a great deal to contribute to the advancement of our knowledge of biological systems and from that the understanding of disease.

I believe it was approximately 6 years ago that we asked our study section—first we created the study section for biophysics and physical chemistry and then asked them to explore in a very systematic fashion both the needs and opportunities for biophysical sciences with direct relevance to our problems in medicine.

Mr. Chairman, they actually undertook a series of some five hearings throughout the country where heads of departments of physics, of mathematics and of biology were brought in on a regional basis



to discuss the state of knowledge of biophysics in relation to health problems, to explain to the biologist the state of knowledge of biophysics, or say of physics and mathematics in terms of understanding to biologists, and to, quite frankly, make the picture of biology and physics a professionally acceptable area that might attract the young bright inquiring mind.

At the time these initial inquiries and studies were undertaken there was, I think, perhaps, two professors of biophysics in this country and our support of the area in terms of our research grants, defining biophysics quite broadly—perhaps Dr. Allen would estimate the amount, but my guess would be \$750,000 to \$1 million.

Dr. ALLEN. I would have to check it.

Dr. SHANNON. Shortly thereafter we made available to support the development in this area a revolving fund to be administered under our specific direction, the fund being made available in the form of a training grant to Massachusetts Institute of Technology that would permit them to move very rapidly in developing training programs and making fellowships available. As these programs developed we could move them into our normal program. Finally we culminated this period of 4 years activity in a very detailed and extensive study program at the University of Colorado at Boulder that lasted 6 weeks. This recapitulation of the total operations in this 4-year period was distributed in published form.

As a result now we have in this country a vigorous program in physical biology. Our medical schools are now beginning to introduce this broadly into their sciences, and our universities are recognizing this as an area of broader study, including both physics on the one hand and biology on the other.

Professorships are being set up. We are now utilizing brains, or manpower, that heretofore had not been available to many of these sciences.

Now in a somewhat similar way, and in the same schools, we have made comparable progress in the field of genetics including human genetics. I think I could summarize all these activities by saying that we stimulate research in institutions by two devices, through the normal professional associations that are available to us to discuss the problems and opportunities in a field, and by calling to the attention of scientists who are working on the periphery of our programs the important relevance that their activities could have to the health sciences.

I really think, Mr. Chairman, that our activities of a stimulatory nature are very carefully conceived, and I think they are very extensive. While I do not propose they are perfect, I think that there are really very few areas in science that we do not affect quite directly.

There is one other thing I would like to note in relation to the institutional grants. We feel that professional schools that produce our scientists, or produce certainly more than 50 percent of our scientists, and, in addition, produce our physicians, have a tremendous variation in quality from the very good to the very poor. We feel that in no small measure such quality is reflected in their activities in the acquisition of new knowledge.

We feel that no medical school which does not have a fairly broad research program can turn out the type of physician who is capable of maintaining an awareness of medical progress in the future.

Certainly this progress is going to be more rapid in the future than it has been in the past. One element in judging instructional capability is an estimate of the amount of research being performed.

Now with the institutional grants, it will be possible for us to work with those schools which do not have major research programs, and I would say these amount to perhaps as many as 25 percent of our medical schools, to develop with them in a very active way research activities. This work will be even more important in our schools of dentistry where, I would say, there that more than 50 percent have essentially no research activity whatsoever.

We can work with them in a very effective way in developing knowledgeable research. Our schools of public health are, I think, well on the way now, and I think with the normal increments strong staffs will result and take care of their problems.

So that I think in general the mechanisms that have been developed for stimulating purposes through the grant mechanism itself, through professional associations that are representative of these groups, and through the disciplined oriented activities of our study sections, and our advisory groups, will supplement the things that are contained in this report.

Now quite frankly, Mr. Chairman, we read into the report more than was there. It is quite obvious, and we did not attempt in preparing our answer, to define that which we are doing now in terms of that which we will do better. So this is the reason for my long dissertation, sir.

Dr. ALLEN. Mr. Chairman, with your permission I would like to add this one thing to what Dr. Shannon has said; namely, that procedurewise we have often thought about this problem.

I think my southern accent will divulge the fact that I have had a personal interest, for 16 years, in schools in the South that have not submitted applications, schools which I felt should. When we examined this situation three different times in formal studies, we found that the percentage, as Dr. Goldberg noted, the percentage approval rate was the same for these schools as for other schools.

In other words, it was the asking power that was not there. Our professional salary policy was written in part to help take care of this problem, in that we say that for the prorated time spent, a school may pay a professional salary from a grant. This policy means, in relation to this subject, that a school in Mississippi, say, could reduce the teaching load of one of the teachers to half time, with the grant paying half of that salary, and then bring another man in who will teach half time and do research half time, with half of his salary paid from the grant. This means there would be two professional people doing half-time teaching and half-time research. The schools are aware of this opportunity. Their problem has been to attract good scientists into their schools where the research activity has been limited.

In connection with the national associations that Dr. Shannon mentioned, this opportunity to augment staff is one of the things that we have explained to the groups assembled. Dr. Price and Dr. Lindsay,

both in the room, have talked to the National Veterinary Medical School people.

Just this last year I talked to the Pharmacist School Association at Boulder, Colo., and explained this opportunity.

One final thing which Dr. Shannon failed to mention is the fact that our fellowship program is designed to give people in such schools an opportunity to go elsewhere to get research training at their current salary. Recipients of such special fellowships come back better prepared to do research and better prepared to ask for grant support.

This is a slow process, but it is being used, and is actually being advertised, as previously mentioned, through association and other meetings.

MR. GOLDBERG. We found, Dr. Allen, in that small sample study which we made jointly that the approval rate of some of the relatively inactive schools was actually higher—

DR. ALLEN. Yes, I noticed that—

MR. GOLDBERG. Than the rates for your largest grantee institutions. This evidence supports the statement which I have heard upon occasion that your study section members are sympathetic to the need for encouraging research in these relatively underdeveloped institutions, and, therefore, are inclined at times to lower their standards when evaluating grant applications from these places.

This situation points up the need for someone to ascertain why these schools are not making a greater effort to submit applications and to compete for NIH grants. This becomes especially important when you consider that many of these schools are large State universities in the South and in the Midwest which have graduate departments in the life sciences where they are turning out students who presumably are going into professional work. If they do not have this kind of research environment in their graduate training, it raises serious questions, I think, about both the adequacy of these educational programs and whether you are not losing an opportunity to reach some people who could make a research contribution in the future.

It was that background which led the committee to suggest that NIH—which of course does not have the primary responsibility for encouraging higher education in this country, but nevertheless does have an active interest in graduate training in the biological and health related sciences—should take some initiative in ascertaining what factors are responsible for this result. And it was here that the committee felt you might be taking more initiative—not necessarily twisting people's arms to submit applications but by giving attention to the situation in individual institutions, or in certain categories of institutions. You might find things that you could do administratively to help these institutions help themselves.

DR. SHANNON. Out of this conversation comes the suggestion that I would be quite willing to make, that is within our capabilities, as a course of action that might satisfy some of the needs that you point out. In general, graduate education in our universities is looked upon by us to be the responsibility of the National Science Foundation, and we have been unwilling to undertake formal action that would introduce our special interests into an area that is really marked off for NSF attention.

So this is one of the reasons why in this large area of graduate education as such, you will find we have undertaken no such inquiry or no such action.

On the other hand, as you say, and as the committee indicated in its report, we are sufficiently involved in graduate education, and sufficiently concerned about spreading the base of excellence to encompass a large number of schools, that I would be more than willing, as the result of these discussions, to carry discussions further with Dr. Waterman of the National Science Foundation, and perhaps jointly with them undertake some such inquiry of this sort, if this could be considered within the purview of their responsibility. I would not like to make a commitment to the committee that we will undertake this, but we will certainly undertake discussions.

The National Science Foundation, as its programs have expanded over the last 4 or 5 years, is itself becoming more and more concerned. The President's Science Advisory Committee in a recent report on graduate education in the sciences points out that one of the unfortunate characteristics of higher education in this country is that real excellence is centered in too few universities, that these universities are large enough and complex enough that the simple further accretion of more activity of more funds, or more personnel, probably will not have the effect that the establishment of new centers of broad excellence will result in. And I think their estimate was that perhaps, and I do not recall whether this came into discussions or whether it was in the report, one should look forward in the course of the coming 5 or 10 years to the establishment of perhaps 5, or perhaps 10, more multipurpose, large graduate undertakings of the character of the University of Chicago, of Harvard, of Cal Tech, or of the likes as an essential part in the development of our higher education in this country.

You would also be interested in knowing, Mr. Chairman, that Mr. Webb, who is Chairman of the Space Agency, has undertaken with NIH, with the AEC, with the National Science Foundation, and with the Office of Education—those are the four agencies that are most concerned with nonmilitary oriented civilian science—a series of luncheon discussions at 2-week intervals to determine what steps can be made in a very positive way, short of committee studies and reports and things of this sort, within our capabilities, to satisfy some of the needs that are brought up in some of Mr. Goldberg's comments.

So I think finally I would say that we are aware of the problem, I think more can be done than has been done, I think the mechanisms are available, and I should be glad to undertake serious discussion with Dr. Waterman relative to the problem, and I am sure that this luncheon group—and these are really serious business sessions, these sessions are not informal lunches among friends, but these are working sessions—and I am sure the groups there will be interested in this discussion which I, too, will bring up for discussion at their next meeting.

Mr. FOUNTAIN. Thank you, that is fine.

Mr. GOLDBERG. Without intending any adverse reflection on your advisory committee system, I think it might be pointed out that it does provide a natural link for stimulating purposes between the NIH program and the stronger institutions. Your study sections



have a very high proportion of persons drawn from the faculty of large, strong institutions, and these people are in a natural position to encourage and assist graduate students, as well as other faculty members, to participate in the program. No such link exists with institutions which might have latent potentiality for participation in the program since they do have fairly sizable graduate programs. Perhaps some special device is needed to augment your regular grant mechanism, and in a sense counterbalance the absence of this stimulation advantage for what we might call the underdeveloped institutions. This would not dilute the test of excellence which you apply.

One other question that I would like to pose in this context relates to your judgment as to the research potential in schools of osteopathy. We noted with a little surprise in ranking institutions by the amount of their NIH research grants, that the schools of osteopathy, which are medical institutions, appear near the bottom of the list. I believe only one school has what one might call a sizable participation in your program. The others have none or only small amounts of NIH research money. This came as quite a surprise to me. At the same time, I appreciate that there is NIH money flowing through the training programs to schools of osteopathy, and they will qualify for the institutional grants which the Congress has enacted.

But the basic question is: Why have they participated so little in your grant program?

Dr. SHANNON. Well, I would be glad to comment on this question. I do have some information that relates directly to the problem.

A typical school of osteopathy in general will have much more resources than, I would say, our poorest medical school. Their income, to a very great extent, is made up of the tuition fees that are collected from other than resources or support in the community, or from States or religious organizations that may have an interest in the furtherance of their university or academic organization. As a result, the physical resources that are available to schools of osteopathy are not such as to permit the superimposition of research, even with the salaries available, upon their teaching program.

The separation of osteopathy from the conventional medical degree granting institution, that is setting these institutions apart as being two groups that may have the same overall objective but elect different routes to satisfy that objective, has been a serious disservice to the development of osteopathy.

The restrictions imposed upon osteopathy by the AMA, by the American Hospital Association, in such things that relate to certification of hospitals, certification of hospital training, are such as to preclude a normal interflow of professional staff of stature between the conventional medical school and the conventional school of osteopathy.

So that all of the forces operative at the present time tend to maintain these groups as a segregated part of the medical sciences.

Now if one took a comparable small group of medical schools and maintained them away from the flow and the interchange of other medical schools, I think in the long run they would also come up with programs developed in isolation.

Now as far as we are concerned, as supporters of the medical sciences, as desirous of the development of new medical knowledge,

we are not concerned with the professional jealousies—I do not want to use the term “professional jealousies,” but I would use the term “the association attitudes” that separate one group from the other.

We fully realize that within the laws of this Nation there are turned out a substantial number of osteopaths that practice in many, if not all, States, medicine according to their likes and in proportion to the training that they receive.

And we calculated one time that from 20 to 30 percent of our population is served by osteopaths.

Now this is why, Mr. Chairman, despite the tensions that exist between the medical schools and schools of osteopathy and the associations that deal with medical practitioners and osteopathic practitioners, we make available teaching grants to schools of osteopathy in precisely the same way that we make them available to medical schools.

We feel that there should develop a closer rapport between the professional association representatives of the two groups. We felt this was going to happen 2 years ago with legislation that took place in the AMA.

We feel that once this compartment that separates these schools off from the other schools is broken, the free flow of personnel between the two schools will then offer an opportunity.

Now this is all on the bad side, because that compartmentization has not been broken. We have had discussions within the past month or two with the School of Osteopathy in Los Angeles. There is the possibility of this envelope being broken there. With the help of the University of California, they are attempting to convert their institution into a school of medicine.

Now some of the other schools of osteopathy cannot do that. Their support, their rules, their guidelines, their governing board will not permit such a change.

This is not the solution. But although the generalities of the separation cannot be affected by our program, the institutional grant that will go to these institutions will at least give us an opportunity to sit down with each of these institutions in terms of their total program and in terms of research, and if they will permit us to be helpful to them in the organization of their research programs, I think we can do a great deal for them.

Now of course our attitude in this regard will be that of extending help if it is requested. We cannot go beyond that. Because the basic legislation that sets up the institutional research grant, or the general support of research and training, is such as to confer upon the institution the full rights of utilizing those funds as they see best within the general guidelines as to what constitutes a reasonable expenditure for research as compared to what constitutes an expenditure for general institutional overhead.

So that while we will not have the prerogative or the opportunity to go into these schools in a very positive way, we most certainly will indicate our willingness to discuss the evolution of their program with them.

But to recapitulate, the lack of resources which is reflected in the lack of physical plant, the separation of the schools of osteopathy from the medical schools in general results in a tendency for ingrowth of

personnel rather than progressive development. This condition serves as a barrier for the evolution of these schools that I feel finds a reflection in our grant applications, and these are the things that must be overcome if they are to develop as logical areas of adequate teaching, which, in our belief, is only possible when there is a substantial research effort that goes side by side with the instruction.

Mr. SMITH. As I understand it, you take the position that the free flow of uniform information between these institutions is very necessary to the success of the—

Dr. SHANNON. Not the free flow of information, the free interchange of personnel I think is essential, yes. And there are obstacles to that.

Mr. SMITH. Then in effect, are you taking the position that VA hospitals, since they have the only central uniform record system in the Nation and so forth, and do certainly have interchange to a greater extent than any other system of hospitals, are you taking the position, then, they are the ones that should do the research work?

Dr. SHANNON. I did not say that.

Mr. SMITH. I know you did not say it, but if you use the same criteria, wouldn't you have to arrive at that conclusion?

Dr. SHANNON. I would arrive at quite different conclusions, sir. But I do not know what you feel my starting premises are. But I do not agree with your conclusion, sir.

Mr. SMITH. Using your premises, wouldn't you arrive at the conclusion the VA—

Dr. SHANNON. I do not think so, sir. I think we do not understand each other's premises. I think the primary limitation on the development of osteopathy was, one, their support, their resources, which in turn determines the physical plant they have to work with and, two, separation of these six schools of osteopathy from the 80-odd schools of medicine, blocking the free interchange of personnel, and finally the social nonacceptability of the osteopath in many circles as opposed to the M.D.

These are the things that serve as barriers to the development of schools of osteopathy.

Mr. SMITH. I am talking about the success of your research grant. This is what you are primarily interested in.

Dr. SHANNON. Yes, sir. But I do not see the necessary relationship of this small segment of the problem to the totality of the research grant program.

Mr. SMITH. As I understood the question, it was to the effect, Why didn't more research grants go to these schools as compared to the medical schools? And of course what you are interested in is getting the greatest results possible.

Dr. SHANNON. We are interested in new knowledge.

Mr. SMITH. From the research.

Dr. SHANNON. Yes, sir.

Mr. SMITH. And as I understood it, you believe that you can get greater results from research money being spent in these medical schools due to certain things that you enumerated. If you use the same basis in comparing VA hospitals with the other hospitals, wouldn't you arrive at the conclusion VA hospitals then also should give better results?

Dr. SHANNON. I would not arrive at that conclusion, sir.

Mr. SMITH. You would not?

Dr. SHANNON. No. I would say there are many good scientists in the VA system, but by and large it is a very large service enterprise. Their primary objective must be the delivery of certain essential services to the veteran. In terms of the aggregate of scientists in this country that are related to clinical investigations as such, they are very small as compared to the affiliate hospitals. The scientists who address themselves to clinical research in the VA will always be small in relation to total physicians because of the primary purpose being the delivery of service, whereas in the medical school this is only one of several primary objectives.

Mr. SMITH. When you refer then to the free flow of information, you really do not mean that to be an important part—

Dr. SHANNON. No. If I said free flow of information, sir, I was in error. When I am talking about free flow, I mean the free interchange of scientific personnel from one group to the other.

Mr. SMITH. That explains the misunderstanding.

Dr. SHANNON. Because information flows freely. There is no exclusion of the osteopathic scientists from the attendance of meetings or from receiving periodicals, or from the discussion of research programs. There is no block to information. There are blocks, though, to the free exchange of personnel.

Mr. SMITH. Then the lack of a uniform central record system in the various hospitals throughout the land, other than in the VA hospitals, is not in your judgment an important factor involved in this?

Dr. SHANNON. I think it is, sir, for certain programs. And for this reason we have turned to the VA for certain problems that make particularly special use of the centralized record system. And we do it in two ways. We are supporting certain studies through the National Research Council that specifically are related to the records system of the VA. We have joined with the VA in those areas of psychopharmacology and cancer chemotherapy and the like that involve the study of really large groups of people under identical circumstances. And I would say in their hospital system they can do problems of this sort in a fashion that is quite superior to any comparable aggregation of private hospitals. So that they have points of excellence that we have attempted to emphasize and nurture, if you will. I do not like to use the word "nurture" because it sounds condescending and this is not my intent at all. Within this tremendous service burden they have, they have developed a scientific excellence in certain areas that is superior to any other system in this country. But when it comes to the highly elaborate type of clinical investigation, then I think, in general, excellence there is centered in our teaching institutions across the Nation.

Mr. SMITH. Then in conclusion you are saying, and I think we would all agree with this, that each research project must be looked at as an entity?

Dr. SHANNON. Yes, sir. With that I would agree completely.

Mr. GOLDBERG. It may be of some value, Dr. Shannon, to place in the record the figures on the amounts of money that you are transferring to the VA for cooperative studies in psychopharmacology and cancer chemotherapy. They are evidently carrying on a substantial amount of such research with NIH funds.



Dr. SHANNON. I might say proportionately the funds would have been greater some years ago than now. Because at the time when it was not appreciated in general, the capabilities that were contained in the VA system, our funds flowed in to a proportionately greater extent than they do now. Now this is recognized and their own direct operating budget has been substantially increased in the last 3 years.

We would be glad to furnish those figures though.

I might say, we will furnish the figures that relate both to the direct contracts we have with the VA and those that are made to scientists within the VA structure for work in the VA hospital.

Mr. GOLDBERG. That would be very fine, Dr. Shannon. However, I would be surprised if you could furnish the latter.

Dr. SHANNON. You are probably right; this might be difficult.

Mr. GOLDBERG. I think you have a reflection in your records only of those grants made for work in VA hospitals where the grantee has made this identification on your form. You do not require this information.

Dr. SHANNON. No. We could give you a minimal figure, but not necessarily encompassing the whole—

Mr. GOLDBERG. We included in the committee report the figure which was given to us by the Veterans' Administration, on the basis of their records. However, in checking this back with your Division of Research Grants we came to the conclusion that even their figures are an underestimate, though they are considerably larger than yours.

Dr. SHANNON. Yes. Well, we will furnish that as best we can.

(The information referred to follows:)

TRANSFER OF FUNDS FROM THE NATIONAL INSTITUTES OF HEALTH TO THE  
VETERANS' ADMINISTRATION FOR CANCER CHEMOTHERAPY STUDIES, FISCAL  
YEAR 1961

Cancer chemotherapy clinical trials in Veterans' Administration hospitals,  
\$828,000.

Mr. SMITH. I am a little troubled yet as to your exact attitude relative to generating more applicants for the research grants. Is there a hesitancy on your part to try to get more applications forwarded?

Dr. SHANNON. Put it this way, I am not interested in stimulating more applicants, I am interested in establishing more points of scientific excellence which indirectly will probably result in more applicants. And I am interested in that, both because our primary mission can be better accomplished if we bring to bear on it brains that have capabilities for contributing that are not now contributing. Also we are convinced if we bring to bear on these problems more scientific environments than are now concerned, that in a very positive way we have stimulated as a very purposeful activity on our part the extension, or the widening, of the scientific base of our programs, both in terms of the number of scientists who are involved and the number of institutions accepting medical research as one of their primary concerns.

Mr. SMITH. Then you do not think more competition for the research grants will result in better results overall—or not?

Dr. SHANNON. I would like to answer this question directly. I do not think competition as such will improve or—

Mr. SMITH. Competition for the grants would give you more latitude in determining a better choice perhaps.

Dr. SHANNON. I think in a sort of abstract way, yes. But our experience in the actual mechanics of the grant programs, as such, always has this element of competition because at the time the grant is assessed there is no knowledge of whether adequate funds will or will not be available to pay the grant. Each year, however large our budgets are, there still will be broad areas where inadequate funds are available to cover all of the grants that have been approved. So that to seek extension of application simply to enhance competition in a program that involves already 1,100 institutions, I do not think in itself would achieve much in the way of an improvement in our basic pattern.

Mr. SMITH. Then you disagree with the committee recommendation primarily, don't you?

Dr. SHANNON. No, sir; I do not because I think the way you phrase it is in a framework that I do not find peculiarly useful to the program. And yet I think if we followed what you would like to see done, and what I would like to see done, we would both do precisely the same thing but for somewhat different reasons.

Mr. GOLDBERG. In connection with Congressman Smith's question and comment, I think it is relevant to point out that with a constant amount of money for financing grants, increased competition would cause you to place your money in relatively more projects with the highest priorities. In all probability the increased competition would mean that you would be supporting a higher proportion of highly rated grants and a lower proportion of the lower rated grants.

Dr. SHANNON. This I would agree with completely.

Mr. GOLDBERG. I bring this up because table 9 on page 28 of the committee report gives figures which indicate that over a period of years the percentage of superior projects, those rated in the highest priority class, has been steadily dropping while the percentage of projects in the middle priority classes has been increasing.

This leads one to speculate that more competition from sources which are now excluded, such as the VA hospitals which cannot now compete, might place you in the position of rejecting some of the lower rated grants that you are now making, even though these are approved as having scientific merit, and concentrating your money in higher quality proposals. This is conceivable.

Dr. SHANNON. Yes. I would agree with that as a generalization. But I would point out that as any grant program becomes broader, and tends to support science in places that are unknown, then this will, regardless of the excellence of the program, tend to diminish the priorities score. Because in the higher priority group—and this is a curve that will largely be determined by the number of grants—there are very few, for instance, below 150, and in the range of 150 to 250. We will say this is what sets that curve, because an applicant to be rated there must be known to be a productive research worker, to have resources available to him, and to be contained within the scientific environment that is conducive to research. So that in some of the areas that we are discussing, or we have been discussing in the past 10 or 15 minutes, it will be unusual for a new investigator to be well known for his productivity.

This is really putting funds at risk, in part, to take advantage of the new brains, and in part on a trial basis to attempt the establishment of science in a new area. In general, the resources may not be

generally available or one may not be certain that there is plenty of resource available, and in general the scientific environment will not be considered to be a highly stimulated one. So that when you go into a program of pulling new people in—new institutions into the research process—almost certainly you will shift the priority rating.

I must say this does not necessarily truly reflect the capabilities of scientists, but this is one of the difficulties on a nationally run program where someone in Bethesda has to make certain determinations about an individual in some place in one of the States, where all he has to judge by is what is on a piece of paper.

You can be certain of individuals who are well known, who have given indication of high productivity, and who are in a very stimulating scientific environment. These you know and can nail down with a high priority. That same individual with the same program, were he to apply from a less-known institution, would have a lesser priority. I mean, this is one of the faults of any central determination or attempt to rate.

And we really deplore the need to rate. But nonetheless, that is the only device we have.

Mr. GOLDBERG. There are some real hazards in the priority system, though unquestionably in the aggregate it performs a very useful purpose. I think a good example of the difficulty would be that of a talented individual who is in a school which is not well known for its research productivity. He would, in all probability, have a far lesser chance of competing successfully than the less talented individual located in a large, well-known institution who can claim association with a prominent investigator, a "big name" in his field, even though the prominent investigator may have only a very nominal part in the project.

Dr. SHANNON. Except for one reason, except for one thing, and that is the tendency for project visits by study section members, or council members to be made to scientific environments not well known, which are much more common than in the case of the individual who is well known. Now I might say furthermore that the mediocre person in a well-known institution of high scientific activity is more prone to be known to be mediocre because he has had contact with the study section members and the like, as compared to an unknown who can prepare a very attractive proposal and who has not had the opportunity, by virtue of his activities, to have a couple of strikes against him before he begins.

So this operates, I think, both ways. And I would agree, Mr. Goldberg, completely, that although priorities are essential, they are a weak reed to lean on.

And certainly in doubtful cases we do not depend upon priorities in the determination of yes or no, we depend upon conversation by scientists with the scientists on the spot.

Mr. GOLDBERG. This is probably a strong argument for the establishment of field review teams which would have a closer contact with the institutions performing research under your program.

Dr. SHANNON. That is an argument in favor of it, yes.

Mr. GOLDBERG. Yes.

Mr. FOUNTAIN. Off the record.

(Discussion off the record.)

Mr. FOUNTAIN. We will go on to recommendation No. 7.

*Recommendation No. 7—The Congress consider action to permit the awarding of research project grants under the Public Health Service Act to VA hospitals on the same terms and conditions as apply to non-Federal institutions (p. 51)*

#### *NIH action*

When originally negotiated the memorandum of agreement between the National Institutes of Health, Public Health Service, and the Veterans' Administration intended that only those Veterans' Administration employees with bona fide affiliations with medical schools (usually a joint appointment) would be eligible to apply for NIH research grant support. The procedure necessarily called for submission of the application by the medical school since the PHS had no authority to make grants to a hospital of the Veterans' Administration. The report by the Committee on Government Operations points out that the procedure has been liberalized through interpretation to include any employees in a Veterans' Administration hospital which has a formal affiliation with a medical school. This liberalization has been accepted by the NIH in view of the close working relationships of such VA hospitals with the medical schools, our understanding being that the selection of VA staff in such hospitals is subject to the dean's committee approval and that the VA hospital becomes a part of the medical school complex.

In the submission of the President's budget to the Congress the administration indicated the desirability of providing a legal base to permit NIH research grants to be made to all VA investigators under the general review and award procedure. If the Congress concurs in the administration's proposal to extend its current procedures to enable all VA scientists, irrespective of medical school affiliation to compete for research support, NIH will implement necessary procedures just so soon as legal authority is provided.

Mr. FOUNTAIN. The Surgeon General's original press release and statement, unintentionally I hope, created an erroneous impression as to what the committee had proposed in recommendation No. 7. It also suggested, as did your statement yesterday, Dr. Shannon, that to apply for an NIH grant a VA employee must personally hold a medical school staff appointment.

Actually, as I understand it, a VA employee may apply for NIH support when his hospital is affiliated with a medical school. And I am glad to see this clarified to some extent in your revised summary report.

However, in view of this history, I think it will be useful to say a word about what the committee did recommend and why.

The NIH-VA agreement apparently was intended to enable qualified VA personnel to compete for NIH support at a time when VA had little or no research funds of its own. The arrangement of routing the grants through the medical schools affiliated with VA hospitals was apparently used to get around the legal restriction on making grants directly to Government personnel. If it were simply a matter of making grants to VA staff holding faculty appointments in these medical schools, I do not see that any special arrangements would be necessary.

The committee noted that there are 36 VA hospitals having organized research programs which, because of geographical factors, do not have an affiliation with medical schools and, consequently, their staffs do not have the same opportunity to compete for NIH grants.

The committee, let me assure you, made no judgment, and attempted none, as to the proper level at which research in VA hospitals should be financed from the VA's own appropriation. We were concerned only with what appeared to be an inconsistency of NIH grants being



available for use in some VA hospitals and not in others. And I want the record to be clear on the committee's position.

Do you have any further comment on that matter, Dr. Shannon?

Dr. SHANNON. I would like Dr. Allen to comment on some of that.

Dr. ALLEN. The original agreement with the Veterans' Administration resulted from a conversation that I had on a train one day with Dr. Cummings, who was then Director for the Research Section in the Education and Training Branch of the VA. It was originally intended that the agreement would cover people who had affiliations with medical schools.

The language, as I go back and look at that agreement now, can be read in two ways, but I do know what the intent was because I happened to be the person representing NIH in the discussions on it, and I drafted the agreement myself for signature. Dr. Cummings and I together visited most of the Veterans hospitals concerned to discuss this intent and to interpret the procedure; namely, that support would be possible for the people who did have medical school appointments, who were doing some teaching but who were housed in the VA hospitals, usually affiliated directly with, and sometimes across the street from, medical schools. The VA staff and medical school faculties were often interchangeable at the time I made this visit.

The grants were therefore quite appropriate, and we thought that we should take this step. We encouraged all concerned to agree and were able to win.

I find that as is noted, the interpretation of this agreement by our institutes has been looser than we originally intended. However, we cannot be concerned about this development after examination of the result, and in consideration of the fact, as already pointed out, that the staff member in the VA hospital is picked in collaboration with the deans, deans committees, and other officials in the medical schools. The VA hospital is a part of the medical school complex.

Therefore, we are not disturbed by the more liberal procedure because it still seems to be close enough to the original intent that we would not have to renegotiate.

The only other thing that I would say is that with legislative authority we would be prepared to extend the program to individuals in VA hospitals who may apply.

I would like to say, though, that when we do, it may be, and this is a personal statement which perhaps I should not even make, there will be substantial numbers of applications that will not pass muster. I am reminded of the thing I wanted to introduce in the record a few minutes ago with reference to the greater number of applications.

At one time representatives of the Association of Dental Schools made a drive for more research grant applications, not selected programming for good people to do a job that needed to be done, but just more applications. The number of requests we got increased threefold, but the approval rate dropped correspondingly down to 28 percent, which was about as low an approval rate as we have ever had on our applications. I believe these results illustrate the fact that we would not necessarily improve our job by getting more applications.

This has been my impression and I could give you a couple of other examples where this sort of thing has happened in the past.

Mr. GOLDBERG. What were these applications for in the example you used?

Dr. ALLEN. Where?

Mr. GOLDBERG. What were they for?

Dr. ALLEN. They were from dental schools that had not had research activities before. The representatives of the Dental Association actually went to these schools, explained the opportunities, and encouraged them to submit the applications.

We received a flood of applications but there was no quality therein. The study section turned down 8 to 10 in a row. I happened to be present when some of this review was going on.

Mr. SMITH. You say that in none of them was there any quality?

Dr. ALLEN. Well, those with quality probably would have come in anyway. This is my point. We have coined the word "programing" which means work by staff people, by study section members, by council members sometimes, in locating those scientists who can extend their present research or initiate new research, through grant funds for additional facilities or equipment or staff to help, extend their activity and expand their work in a given area. There is also the possibility, mentioned earlier, that some of the existing faculty people could have part of their salaries paid from grants with additional staff recruited from people who are being trained through the extensive training grant program.

To me, selective programing is highly desirable and effectively used by NIH on a broad base.

Mr. SMITH. It seems to me you could select out of the greater number, a smaller number—

Dr. ALLEN. I would add that we do "program" regularly, as suggested by my reference to the national association meetings. Through trips we are making to small institutions all our staff describe program needs and opportunities. It is a slow process, however, because unless they have men with an interest in doing research, it is most unlikely that the small schools will take advantage of this opportunity. Progress comes slowly, but our record shows an increasing number of institutions receiving grant support. The much greater spread of the funds into smaller institutions illustrates the fact there has been some success.

The particular reason I am interested in programing is that I feel this method will combine merit with greater activity rather than useless additional activity in application review through just getting a larger number of applications.

Mr. GOLDBERG. In relation to the question of quality of applications, the chairman noted that there are 36 VA hospitals which have organized research programs, but because of the nature of your agreement are not able to compete. The people in the VA have assured me that the quality of research in these 36 hospitals, as contrasted with the remaining VA hospitals which do not have organized research programs, is as good, or nearly as good, as it is in the hospitals which have a medical school affiliation.

The hospitals having a medical school affiliation use the same review structure that is used in the 36 remaining hospitals having organized research programs. There is a research committee in each composed of VA hospital staff which screens the applications, and approval is

required also of the hospital manager with respect to space. In the affiliated hospitals, the research committee acts for the dean's committee in screening project applications which are then sent to the medical school for submission to NIH.

Regardless of the question of whether it would or would not be desirable to encourage more research in this way, rather than through the VA's own budget, I think the evidence is pretty strong that there is potential here which is not being tapped by NIH because of the nature of your agreement.

Dr. ALLEN. We made an assumption which we have given up. We are prepared to move ahead now and to open up the program to the other VA hospitals. We are not arguing this point at all.

I would like to add that when we provide the data that you requested a few minutes ago on how much money goes to the VA under the cancer chemotherapy and psychopharmacology programs, as well as a number of other programs where we do use the VA hospitals, you will find that these very hospitals to which you refer are receiving support through these means.

Mr. GOLDBERG. Oh, yes; in cooperative—

Dr. ALLEN. Hence, there is money going into those hospitals for that type of research, where they work together under a common protocol that has been developed by experts, and that involves a clinical procedure requiring more cases.

Mr. GOLDBERG. For directed research in the cooperative projects, but not for individual projects in this other area about which we are talking.

Dr. SHANNON. The thing I wanted to comment on is I do not think we would say now, and I am sure if Dr. Allen negotiated this deal now that he would base it on the presence or absence of excellence. At the time this was made no excellence was in the area that the negotiation covered. But since that time there has been, to my knowledge, about a fourfold increase in the support of medical research by veterans appropriations. And the issue now is not so much excellence or non-excellence, but rather the basic philosophy of the executive administration as to whether or not an agency shall defend the funds that are required for his total operation, or whether a part of the funds should be contained within a given executive agency shall be defended centrally along with that same function in a number of executive agencies. In other words, and this I would rather not comment on, the Bureau of the Budget has taken a positive attitude that they would prefer to provide an adequate base of biological medical research for the Veterans' Administration, and then for such additional funds as can be used effectively they would like to look to an objective agency such as our council structure for determining advice as opposed to permitting the VA to request such funds as it needs totally and defend those funds before the Congress.

So that this is no longer a question of excellence, but rather a question of executive policy on how medical research as such should be handled by the executive branch that is at issue right now.

Mr. FOUNTAIN. I can understand that. I would agree also with the view that the mere stimulation of applications, while it may produce useful research, is not an end in itself.

(Discussion off the record.)

Mr. FOUNTAIN. We will take up recommendation No. 8.

*Recommendation No. 8—The Director of NIH review the training policies and procedures of the Institutes and the Division of General Medical Sciences for the purpose of obtaining a greater degree of uniformity and simplification (p. 55)*

#### **NIH action**

Studies of various aspects of NIH training policies and procedures of the nature recommended by the committee have been in process for 2 years, and extensive changes have been made in these programs. Substantial gains in the direction of uniformity and simplicity have been possible in the past year.

Examples of gains in uniformity which have recently been accomplished include (1) establishment of a central office and mechanism for receipt and referral of all training grant applications in the Division of Research Grants, (2) adoption of a common appointment form (2271), and (3) procedure to provide for DRG editing and coding for informational purposes of all trainee appointment notifications submitted by all training grant program directors.

Policies acceptable uniformly to all Institutes have been developed in regard to (1) indirect cost payments on stipends, (2) payment of tuition and fees, (3) carryover to succeeding year of unexpended funds, and (4) a common forward financing procedure.

There remain several differences in policies and practices among the several Institutes in regard to training grants which may in the word of the committee report "be necessary in view of the individualized nature of NIH training programs." These are complex areas of activity that will be kept under constant surveillance.

Mr. FOUNTAIN. Table 6 on page 22 of the committee's report notes that NIH spent approximately \$92 million for training purposes in 1960. The appropriation for training grants and fellowships was increased in 1961 to \$132 million. With expenditures at this high level, I am inclined to believe the committee would like to learn a good deal more about the purposes for which this money is being spent.

Before asking you several specific questions on the training programs, I wonder, Dr. Shannon, if you or one of your associates would care to give us a brief outline of the extent to which your various programs are intended to train personnel for medical service as well as for research—or for a combination of these objectives?

Dr. SHANNON. Yes, sir. First I would like to comment on the budget figures. A large fraction of the increase, essentially all of it, and I cannot recall the precise dollar value, was made available in the 1961 appropriation so that we could finance all of our research training grants. Having the money available then in the spring as opposed to the summer, or early fall, it will be possible for schools to program the use of those funds more effectively. So that the budget increase last year did not envisage a substantive increase in the size of the program, but rather a regularizing of the payment schedule in a fashion that would permit repayment. So this appeared as a non-recurring expense in the 1961 budget, and it was not contained in the 1962 base. In point of fact, from the standpoint of straight forward fiscal considerations, it is more a bookkeeping device rather than an additional expenditure. Because in an expenditure budget the bulk of the funds would be expended in much the same way.

Now, what I would like to do then is address myself to the basic training program. As to purpose, in our basic authorization we have the authority to train both for research and for service purposes. Our training in the different Institutes will emphasize these two separable aspects in quite a different way. For example, in the National Institute



of Mental Health the bulk of the dollars go into the training of service personnel, and this goes all the way from the training of psychiatrists to clinical psychologists and so forth. In supporting training in schools of nursing and schools of social work, they are providing for additional graduate training and convert general purpose nurses and social workers to ones capable of operating in the field of medical health. This generally will involve an additional year of training. I do not have the figures now before me, but I would hazard a guess and we could furnish the figures, that about 80 percent of the total training grants going to the Mental Health Institute are for service purposes.

The necessary part of this, in terms of the national need, which has been further emphasized this past year by reason of the report of the Commission on Mental Health supported by Congress in the study of the needs for the mentally ill, is the area of training. At the present time the field of the mentally ill has perhaps its most single severe handicap the inadequate number of specially trained people. I would say predictably in this area service personnel will continue to dominate the utilization of the mental health training dollar.

Now, in the remaining areas one can find specific examples of training for service, and I have in mind specifically training funds for the Dental Institute for the training of chair side assistants so as to extend the capabilities of a number of dentists. This is not to train the individual, but establish areas of training where these individuals can acquire this type of experience. But in general, the remainder of the funds will be addressed to the training of scientific personnel. Now, even here this will vary Institute by Institute.

Now, I would like to take up the special case of neurology and compare that to the special case of, say, Arthritis and Metabolic Disease Institutes. At the time of the establishment of the National Institute of Neurological Diseases and Blindness, in Dr. Pierce Bailey's testimony, he presented to the Congress the fact that at that time, which was 1955, I believe, there were only 30-odd States in this Nation that had qualified neurologists.

He was referring to certified neurologists available to care for neurologically handicapped individuals. In establishing a research program in the neurological diseases, we explained to the Appropriations Committee that one must first develop a group of academic neurologists who could provide adequate services within the medical school environment for the care of the neurologically handicapped as a prelude to undertaking investigation. Thus if an individual was going to develop research competency in this area, he must first go through a period of broad neurological training before addressing himself to the special problems of research into the neurological diseases.

In precisely the same fashion, Dr. Bailey went on to describe the plight of ophthalmology in terms of the absence of academically oriented ophthalmologists with capabilities for research, and similarly in the other sense specialties such as the ear and problems of speech.

So that a major part of the Institute of Neurological Diseases and Blindness training program is directed toward developing professional competence as a point of takeoff for definitive training in research. Thus a good deal of the funds in this area will be spent on the basic problem of developing an adequate neurologist who will use his skills partly in service, but primarily in teaching and in research.

Now, if one goes over to the Institute of Arthritis and Metabolic Diseases, where one is dealing with the problems of arthritis, diabetes, and the like, these are well-established medical specialties. I am fairly well convinced that ordinary training programs will develop fully pledged service personnel to cover these specialties. We will find in those areas that the bulk of the research training dollar is spent in specific training which will permit an individual, given an adequate basic background to develop the additional skills that will permit him to do research in the area. One can categorize that program as exclusively related to highlighting research capability. I think if you look at the other Institute you will find variations between the problem as faced by the Institute of Neurological Diseases and Blindness and that by the Institute of Arthritis and Metabolic Diseases. Most of these programs are primarily, if not exclusively, oriented to the training of research personnel, but in certain instances they must go a step lower to provide the basic excellence upon which the research training can be developed. However, they are not oriented in a special fashion toward service, whereas mental health training programs are primarily oriented toward service and only secondarily oriented toward research.

Now again, I would like to point out that at times there occur within each of the categorical Institutes very specialized needs which result in the setting up of a very specialized training program oriented toward service. I can give you an example of that.

In the Heart Institute, when it became perfectly obvious there could be a broad saving of lives with the adequate use of anticoagulants in the case of coronary attacks and cerebral attacks, there were literally not enough people in this country skilled in the techniques for the control and use of the drug. The Heart Institute set up, utilizing its technical assistance funds, training programs to specifically create training centers to turn out the technicians who could make available these measurements to the physicians and in turn permit them to take advantage of this medical advancement.

A great deal of work is done now that in general will be contained within the technical assistance funds rather than the training grants. Although the function is there, it does not appear as a training item.

Mrs. DWYER. Mr. Chairman, may I ask a question at this point?

Mr. FOUNTAIN. Mrs. Dwyer.

Mrs. DWYER. This may not be directly on your point, but I would like to know how you develop a Federal grant program for a relatively new disease like cystic fibrosis.

Dr. SHANNON. Well, I will tell you what was done with cystic fibrosis, and I think this is a very good example of how we would do it in any disease.

At the time we addressed ourselves to cystic fibrosis we were just, budgetwise, at a position where what one could say the truly urgent needs of some of the really major diseases were beginning to be satisfied. This was about 1956, and going into 1957.

The first thing we did, and this was in response, or subsequent to fairly extensive discussions with our Appropriations Committee, was to have a series of Federal working conferences to try to find out what are the elements that go into, or most likely would go into, a basic understanding of this disease. And as a result of those discussions,

there turned out to be three such elements. One was a better understanding of the problem of infection, because most of these children were peculiarly susceptible to infection. This is something the simple maintenance of life demands, an ability to handle infection, to handle infection with extraordinary resistance; namely, staphylococcus infection, generally not susceptible to the conventional antibiotics.

The second broad problem was the problem of understanding the metabolic consequences of the disease. Now this is a disease that is inheritable, of genetic origin, that involves broad changes in the gastrointestinal tract, and the glands that feed digestive juices into the gastrointestinal tract. They have a fairly profound effect on the capability of the individual to handle food. This is the metabolic consequences.

The third element was we did not know when we first undertook the study of the disease actually how important it was. The very obvious cases died. But at the time we undertook the study it was not known whether there were varying degrees of severity of the disease and the extent to which individuals could, with a little help, perhaps go into adulthood, and what was the ultimate cause of the disease. So we had to develop diagnostic means to address ourselves to the problem of prevalence and the problem of variation in severity.

The individuals who were called in on these several conferences then were able to spot individuals in their own scientific communities, that might have an interest in understanding this disease, providing funds were set aside and put out on a capital risk basis essentially to attract them into the area. This is frankly what was done.

These people who had the capabilities of addressing themselves to disease were approached from the standpoint of would they be interested in joining in a study of the disease through a series of studies that could be correlated one to the other in the area of infection, in the area of metabolic phenomena, and in the area of diagnostic measures.

At the same time, in order to obtain better information on prevalence, as I recall, the Children's Bureau was brought in with their facilities in relation to child health to give better information on what was going on that was not within the purview of our study sections committees and our scientists, to create a greater awareness of the breadth of the problem—to get information on its prevalence.

So our initial steps were along these lines. Now in general, as happens in this area, once having created this initial wave, it spreads. And we have not had serious difficulties since that time in the progressive extension. Because having called the disease to the attention of individuals who had the capabilities of contributing; having had, I would guess at about 18-month intervals, conferences to discuss program progress, there was a widening understanding of this disease as the natural consequence of these initial moves. I think this in general is the pattern that we follow in most of these things. We actually go out and stimulate research ourselves.

Mrs. DWYER. Are you satisfied, Dr. Shannon, that you have gone far enough?

Dr. SHANNON. I am satisfied that in terms of the leads that are available, that the likelihood of stimulating further interest, further activity at this point in time, would not be sufficiently profitable that

I would be willing to put an all-out effort to involve more people. I think the things that we started have now defined the disease so that further approaches to it will result, and its ultimate solution will derive, from the impact of advances from collateral scientific efforts upon this central issue than focusing more attention on the disease in itself.

Now we have a fairly substantial investment in research on this disease in our own installation in Bethesda. We see the ramifications of this in a whole variety of programs. For example, the diagnostic tools now available relating to the salt content of sweat was from an appreciation of collaterally interested individuals rather than individuals who were immediately directing their attention to the disease. I think our general experience would bear out the thought that having established a hard core of continuing interest in the disease phenomena itself from the standpoint of determining the prevalence, determining its natural history, further studying the metabolic effect, that breakthroughs will come, or won't come through, if one maintains the problem in a position of visibility. This is the important thing rather than attempting to channel an overwhelming amount of activity toward the disease itself.

Mrs. DWYER. I have been a leader of the Cystic Fibrosis Committee in New Jersey, and I find from my limited experience that parents are complaining that the doctor is not able to diagnose the disease.

Dr. SHANNON. Now, the only diagnostic tool at the present time is the result from the deficiency of salt secretion by the sweat glands. And I would say the proper use of that tool, in association with a sound clinical appraisal, is quite adequate for diagnostic purposes. On the other hand, I would think the primary difficulty the family finds itself in is that there is not general awareness of the problem on the part of the practicing physician to an extent he can make use of all the information that apparently is available. I might say in our present accelerated drive for increased knowledge, this is lagging in many areas, that is the ability to communicate new knowledge in a form that is useful to the general practitioner. The Public Health Service is very well aware of that and that at the present time has a study of the problem of scientific communication, a study of the communication of knowledge to the practicing physician in the form of continuing education, and communication of knowledge to the public. We feel this is perhaps an overall Public Health Service responsibility rather than an NIH responsibility. But I think we have a very serious responsibility to call to the attention of the other Public Health Service activities that information which should be transmitted. I think we have a very serious responsibility to determine whether or not such information is being transmitted effectively. I do not think we have done a good job in this particular area in general up to the present time, and I know the Surgeon General—Surgeon General Terry is quite dissatisfied with the present situation.

I think the structure of the Public Health Service at the present time is not wholly conducive to the natural carrying out of this function. The proposed structural change, which would split present Bureau of State Services into an Environmental Health Bureau and Community Services Bureau. This latter Bureau would be purely concerned with health problems on a community basis, with the prob-



lems of the delivery of services. This changes, I think—the simple reorganization that would be incidental to splitting this off as a separate problem—would probably be very important in determining its effectiveness and I am hopeful this legislation would go through.

But quite apart from that, we are right now addressing ourselves to the problem of communication. I would think that in this particular case that the fault is in part lack of knowledge, but only in part. In part it is lack of communication to the practicing physician on that which can be done and that which cannot be done.

Mrs. DWYER. How does the medical profession avail itself of this information?

Dr. SHANNON. They do really, but the problem is complex. It is difficult for me to say exactly how since I have never practiced medicine and have always been, subsequent to hospital training, concerned with the acquisition of new knowledge.

Mr. SMITH. What she means is how do they get the time to read all this?

Mr. FOUNTAIN. It is sort of like a child doing his homework.

Dr. SHANNON. This is what I was going to say. I would imagine, not having been a practitioner, a practitioner's day must be a very frustrating experience. Because you meet so many problems about which one does not have the factual information. But I would think that probably these are the problems that condition his reading. I do not know.

Mrs. DWYER. The reason I asked you this question is because the Congress was aware of the need for appropriating money—

Dr. SHANNON. Yes.

Mrs. DWYER. To do research on this new disease, or new as far as the public is concerned. After the money was appropriated and NIH did or supported the research, and did a fine job in discovering a diagnostic tool, from there on how do you get that information used by the medical profession for helping these youngsters?

Dr. SHANNON. This is precisely the thing I say we are doing very poorly now. We have mechanisms that are available but they are not adequate. We have the mechanisms of the conventional publications and the conventional medical journals, and there are conferences and seminars that are conducted on both the State and local county medical level, and there are the associations and the societies purely related to this problem in their own communities. But as is the case in so many problems, the ability to communicate hard research facts pertaining to the clinical problems the physician meets on a day-to-day basis we do not feel is adequately covered within the culture we are living in at the present time. Something over and above the conventional means must be developed that will in some way tune the reception of new information on the part of the practitioner to the rate at which it is developed.

Mr. GOLDBERG. Isn't NIH doing something special, Dr. Shannon, in encouraging the use of diagnostic tests for cancer? Aren't you taking the initiative in that area?

Dr. SHANNON. We did. This is part of our so-called professional and technical assistance program. About 3 years ago, as the result of a program decision, we felt that this kind of program was an operation that was much more closely related to the aims and objectives of the Bureau of State Services. Thus, while we defend the budget at the

present time, after discussions with the Bureau of State Services, that is the program developments, nonetheless this program is actually conducted by the Bureau of State Services. It is in this area where the new Bureau of Community Services that will be purely related to the health services in the community will perform a very important service in improving the mechanics of delivery of service. I think when the Public Health Service can highlight the needs by increasing special apparatus this will run smoother. But I do not think we should wait for simple administrative changes to bring this about. There are certain things we hope can be done now that are under immediate and direct study at the present time.

Mr. GOLDBERG. The success of the new structure would presumably also require that the program be well financed, when it is no longer included in the NIH appropriation, to get this knowledge out to the practitioners.

Dr. SHANNON. I would think so. I think this is an important function.

Mr. FOUNTAIN. I believe Dr. Goldberg advised your office that the subcommittee would like information on the number of persons receiving training and the amounts being paid through NIH training grants and fellowship programs, in terms of the academic level of these trainees and their health fields or professions.

What proportion of persons in each of these training categories receives stipend support from NIH programs? Do you have that information?

Dr. SHANNON. I can answer that first question and then call on Mr. Murtaugh. Mr. Goldberg made that request on Monday and I asked Mr. Murtaugh if he would accept the responsibility for developing the information.

Maybe while he is getting this together I can answer that.

One piece of information we do not have is the number of total people who are directly affected by the training program, but who bear no direct or indirect physical relationship to the Federal Government. In other words, when we set up a training program, for example, say in a school of social work to develop competence in the field of psychiatric oriented social worker, in that case I would guess a grant would be primarily concerned with the development of one or two faculty positions and very little concern with the provision of stipends for students that attend, although some of that money will be made available to assure the school of some continuity of students.

But this environment that this created would be expanded to encompass students who will be supported from a wide variety of sources. So that in terms of the total people who benefit from the training program, this we do not have factual information on in many cases. But perhaps Mr. Murtaugh would like to take it from there.

Mr. MURTAUGH. I think that is the key aspect of the question that you asked. You asked what proportion of the people being trained in this area receive stipends from NIH programs. We do not know. We do know the numbers that are receiving NIH stipends—that runs roughly 9,500—in the training grant program that is who are receiving some stipends from these NIH supported programs.

Mr. FOUNTAIN. To what extent are there variations in the stipend amounts between professional or specialty fields for the same level of training?

Mr. MURTAUGH. Well, there are variations in the stipend amounts that are paid. I do not have data here that shows the variation within the same professional field. But in terms of the same level of training there are variations amongst institutions. In the predoctoral area it ranges here from some \$100 to \$600 per month in terms of the monthly stipends variations at the predoctoral level.

Mr. GOLDBERG. Could you provide some specific information in this area for the record?

Mr. MURTAUGH. Yes, we would be glad to. You had asked for this information on Monday afternoon. It was prepared yesterday and we really have not had a chance to look at it in terms of its relevancy to the questions that you have asked. We would like to be able to prepare it in a more suitable and informative form for the record.

Mr. FOUNTAIN. We would appreciate it if you would.

(The information referred to is as follows:)

*Monthly stipend variations in selected institutions awarded under NIH graduate training grants, fiscal year 1960*

Institution	Predoctoral	Post-Ph.D.	Post medical
Columbia University.....	\$100-\$500	\$90-\$500	\$270- \$830
Harvard University.....	210- 430	100- 500	180- 680
University of California.....	210- 400	-----	300- 530
University of Minnesota.....	100- 450	110- 690	250- 720
University of Oklahoma.....	160- 600	-----	150- 810
University of Texas.....	130- -----	130- -----	120- 580
University of Washington.....	150- 360	-----	250-1,000
University of Wisconsin.....	180- 270	-----	-----
Tulane University.....	190- 400	-----	250-1,000
Yale University.....	110- 480	-----	260- 600

NOTE.—Such factors as dependents, number of hours per week, field of training, etc., affect variations in stipends.

*Range of stipends paid full-time predoctoral trainees on NIH pharmacology training grants, fiscal year 1960<sup>1</sup>*

Amount of annual stipend <sup>2</sup>	Number of trainees	Amount of annual stipend <sup>2</sup>	Number of trainees
\$1,200.....	1	\$2,900.....	2
\$1,600.....	1	\$3,000.....	11
\$1,700.....	1	\$3,100.....	1
\$1,800.....	17	\$3,200.....	2
\$1,900.....	1	\$3,300.....	1
\$2,000.....	15	\$3,400.....	2
\$2,100.....	10	\$3,600.....	1
\$2,200.....	13	\$3,800.....	2
\$2,300.....	2	\$3,900.....	2
\$2,400.....	18	\$4,000.....	5
\$2,500.....	10	\$4,200.....	2
\$2,600.....	3	\$4,700.....	1
\$2,700.....	2	-----	-----
\$2,800.....	11	Total.....	137

<sup>1</sup> The variations in stipends are influenced by the following factors: Number of dependents, economic circumstances of the graduate student, institutional policy, progress toward completion of degree requirements.

<sup>2</sup> Short-term appointments have been converted to an annual rate.

Mr. FOUNTAIN. When did the NIH first begin awarding predoctoral fellowships?

Dr. ALLEN. There was a very small program as early as 1947. It was an across-the-board program initiated in 1947-48 which has grown very slowly but steadily.

It has not had the phenomenal growth of the research grants program, nor have we felt it should grow rapidly.

Mr. FOUNTAIN. Do you have any information on the careers being followed by the people who have earned Ph. D. degrees under this program in the past?

Dr. ALLEN. We do have. We have continuing records of this type information through a followup form. The people who have completed their training with fellowship support and who have gone into part-time or full-time research in academic careers, number 88-plus percent.

We were told at the beginning of the fellowship program by a group of outstanding consultants from across the country that if we could one day report that one-fourth of those receiving training would stay in research, we would have a very profitable program. We have therefore been quite gratified to have the experience I have just reported.

Mr. FOUNTAIN. How many predoctoral fellowships did you say?

Dr. ALLEN. Well, I am speaking in terms of the total fellowship programs; 88-percent-plus was the last record I saw on the total.

Mr. FOUNTAIN. I wonder if you would furnish for the record the number of predoctoral fellowships NIH presently supports by fields of study?

Dr. ALLEN. Yes, sir.

Mr. MURTAUGH. On the predoctoral it would run in total around 2,500 roughly. We will provide that for the record.

Mr. GOLDBERG. Can you break that down by fields of study?

Mr. MURTAUGH. We shall attempt to do that.

Mr. FOUNTAIN. Will that be burdensome?

Dr. ALLEN. No.

Mr. MURTAUGH. No, I do not believe so.

Dr. ALLEN. We have the data broken down by disciplines. It is meaningless at the predoctoral level to break it down by programs. (The information referred to follows:)

*Number of research fellowships awarded at the predoctoral level by the National Institutes of Health, fiscal year 1960*

<i>Type of fellowship</i>	<i>Number of awards</i>
Total, all types-----	2,460
Regular predoctoral fellowships-----	1,066
Student part-time fellowships-----	1,261
Postgraduate fellowships-----	133



*Fields of training of fellows awarded regular predoctoral fellowships,  
fiscal year 1960*

<i>Field of training</i>	<i>Awards</i>
Total-----	1,066
Anatomy-----	21
Anthropology-----	31
Biochemistry-----	133
Bioengineering-----	12
Biology (general)-----	42
Biophysical chemistry-----	24
Biophysics-----	33
Biostatistics-----	19
Cytology-----	14
Embryology-----	22
Entomology-----	8
Epidemiology-----	1
Genetics-----	45
History of medicine-----	6
Microbiology-----	85
Nursing education-----	29
Nutrition-----	3
Organic chemistry-----	96
Pathology-----	2
Pharmacology-----	28
Pharmacy-----	1
Pharmaceutical chemistry-----	5
Physical chemistry-----	3
Physiology-----	109
Psychology, general-----	6
Developmental-----	19
Experimental, comparative, and physiological-----	116
Experimental psychopathology-----	35
Personality-----	18
Social-----	51
Public health nursing-----	6
Radiation physics-----	2
Radiology-----	3
Sociology-----	34
Veterinary science-----	1
Other-----	3

NOTE.—Student part-time fellowships and postsophomore fellowships cannot be broken down by field.

Mr. FOUNTAIN. You will recall the committee, in recommending a greater degree of uniformity in the stipends and standards followed by your various Institutes, expressed the feeling that some of these differences were probably due to administrative decentralization rather than program necessity.

In what particular clinical fields does NIH provide stipend support for residences in medical institutions, what are the stipends in these fields, and why do you support residencies in these fields?

Mr. MURTAUGH. Well, we have data indicating the areas of clinical specialties in which NIH does support residents presumably in terms of the research emphasis of their work. We do not have data here on

what proportion of those, or the nature of the stipends that are received by that particular group.

There are roughly 1,300 NIH-supported residencies, for instance, in 1959 out of 26,000 or 27,000 residencies reported by the AMA—out of that 26,000 or 27,000—some 1,400 of them were supported by NIH—received some form of NIH, support.

Dr. SHANNON. Mr. Chairman, there is one fact I would like to add to Mr. Murtaugh's comment at that point that refers to something that I said a little bit earlier.

Those areas where we support substantial percentages of the total residencies are areas of specific concern to us, and I would like to point out those areas.

These are the last figures we have from the AMA for comparison purposes. In neurology in 1959 we supported 72 percent of the residencies in one way or another of all the residencies in that specialty in the country.

This was in a drive, as I said, to produce competency in an area where there was a broad national deficit. In psychiatry we supported by our training program 27 percent of all the psychiatric residencies in the country.

In the other two areas, ophthalmology and otolaryngology, it was 15 and 15 percent, respectively. These are the big contributions of our programs to the residency training programs, each case highlighted by very severe shortages to the extent that there are an inadequate number of individuals being trained to satisfy the service responsibility, much less to develop competency in research.

Now others will show minor percentages in relation to the total body of residencies. We will be glad to furnish a further analysis of that.

Mr. FOUNTAIN. We would appreciate it if you would, including the amount of stipends in this field.

(The information requested is as follows:)

*NIH support of residencies*

Specialty	AMA residency data		NIH-supported residents	Percent
	Number offered, 1959	Number filled, 1958		
	A	B	C	C/B
Neurology.....	451	324	235	72
Gastroenterology.....	80	65	-----	0
Cardiovascular diseases.....	154	132	-----	0
Psychiatry.....	3,795	2,770	738	27
Otolaryngology.....	501	433	64	15
Ophthalmology.....	762	708	103	15
Pathology.....	2,743	1,811	63	3
Radiology.....	1,879	1,389	58	4
Internal medicine.....	5,761	4,842	23	0
Surgery.....	5,836	5,373	52	1
Dermatology.....	333	295	-----	0
Pediatrics.....	1,915	1,682	-----	0
Obstetrics-gynecology.....	2,594	2,406	14	1
Neurosurgery.....	366	304	2	1
Anesthesiology.....	1,409	1,132	-----	0
Pulmonary disease.....	366	281	-----	0
All other.....	3,538	2,811	-----	0
Total.....	32,483	26,758	1,352	5

AMOUNT OF STIPENDS PAID TO RESIDENTS SUPPORTED THROUGH NATIONAL INSTITUTES OF HEALTH TRAINING PROGRAMS—FIELDS WITH HIGHEST PROPORTION OF NIH SUPPORT

1. PSYCHIATRY

NOTE.—NIH support of residencies in psychiatry is provided by the National Institute of Mental Health. The stipends are set nationally by NIMH and are paid entirely from Federal funds. The usual psychiatry residency is for 3 years. The stipends listed below for the 4th and 5th years are provided for additional years of training in a psychiatry specialty such as child psychiatry. In addition to the support of regular psychiatry residencies, NIMH also conducts a special program of support for psychiatry residencies for physicians who have already been engaged in general practice. The stipends for this special program must necessarily be set at a higher level than the stipends for the regular psychiatry residencies because the physicians who undertake training under this special program give up already established practices for the duration of residency. For the general practitioner training program, the limit for stipends is set at \$12,000 with the actual amount to be determined by the training institution. The average stipend actually paid in 1960 was approximately \$10,000.

*Stipends paid to regular psychiatry residents under the training program of the National Institute of Mental Health, fiscal year 1961*

Year of training:	Amount of stipend
First year.....	\$2,400
Second year.....	3,000
Third year.....	3,600
Fourth year.....	6,000
Fifth year.....	7,000

2. NEUROLOGY, OPHTHALMOLOGY, AND OTOLARYNGOLOGY

NOTE.—The National Institute of Neurological Diseases and Blindness provides support through training grants for residents in the fields of neurology, ophthalmology, and otolaryngology. The stipends for these residents are set by the training institution within ceilings established by NINDB. At the discretion of the institution the stipends may be paid entirely from training grant funds, may include both training grant funds and institutional funds, or may be paid entirely from institutional funds

*Support by the National Institute of Neurological Diseases and Blindness for Neurology, Ophthalmology, and Otolaryngology residing stipends*

Field and year of residency	Ceiling on stipends set by NINDB <sup>1</sup>	Average residency stipend paid by NINDB funds <sup>2</sup>
	A	B
Neurology:		
1st year.....	\$4,500	\$3,427
2d year.....	5,000	3,210
3d year.....	5,500	3,431
Ophthalmology:		
1st year.....	4,500	2,680
2d year.....	5,000	3,311
3d year.....	5,500	2,507
Otolaryngology:		
1st year.....	4,500	1,920
2d year.....	5,000	2,025
3d year.....	5,500	2,185

<sup>1</sup> An additional \$500 for each dependent is added to the stipend ceiling.

<sup>2</sup> The average is for stipends paid from fiscal year 1957 through fiscal year 1961. The stipend paid from NINDB training funds may be supplemented by the training institution from its own funds up to the ceiling established by NINDB.

## VARIATIONS IN STIPENDS PAID TRAINEES

The Public Health Service Act authorizes the payment of stipends and allowances to trainees receiving training under NIH training grants. Under present procedures all Institutes administering training grant programs permit the institutions to set the stipend levels for trainees supported through such grants, except the National Institute of Mental Health. NIMH has set national stipend levels for each level and kind of trainee. The National Institute of Neurological Diseases and Blindness sets maximum stipends which are comparable to the regular fellowship stipends.

For the other Institutes stipends are set by the grantee institution in accordance with its own policies and standards as in like manner are the criteria for the selection of trainees. Among the factors taken into account in the determination of stipends by the training institution are the professional and scientific experience of the trainee, the peculiarities of his field, his current earning capacity and his needs in respect to the number of dependents. As a consequence of these factors and the differences in institutional policies, there is a considerable range in the actual stipends paid to trainees. These variations are such as to render comparisons of variation among institutions of stipends paid within a specialty field essentially meaningless.

Mr. FOUNTAIN. We have had a quorum call, and if it will not be too inconvenient to you gentlemen, I think it might be wise to recess until 1:30. I had hoped we would finish this morning because I think we only have about 30 or 45 minutes to go.

We stand in recess until 1:30.

(Whereupon, at 12:30 p.m., the subcommittee was recessed, to reconvene at 1:30 p.m., on the same day.)

## AFTERNOON SESSION

Mr. FOUNTAIN. Let the subcommittee come to order. When we recessed for lunch I believe we were discussing some of the characteristics of the NIH training programs. I believe Dr. Shannon indicated that he would provide information for the record on the particular clinical fields in which NIH has paid stipends for hospital residencies and the levels of those stipends.

Dr. SHANNON. This we will do.

Mr. FOUNTAIN. In connection with stipends for graduate-level training, our report states on pages 55 and 56:

The committee does not question the needs for Government stimulation of specialized training in clinical areas of medicine where service personnel are in short supply, but the committee does entertain doubt as to the wisdom of paying very liberal training stipends to physicians who will subsequently earn larger incomes in private medical practice as a result of such training.

And then a subsequent paragraph states:

It is not certain that high training stipends are essential to attract physicians to these specialty fields. If large stipends are necessary, it would be a more appropriate policy, in the committee's judgment, to require some kind of repayment to the Government in these cases. This repayment could take the form of requiring that a portion of the individual's professional work be devoted to Government service or teaching; or the stipend could be converted in whole or in part to a repayable loan \* \* \*.

Dr. Shannon, have you had occasion to give those two statements any thought?

Dr. SHANNON. Mr. Chairman, we have, and this recalls some fairly extensive discussion that we had in the midfifties when these practices, which at one time were very small, were considered for considerable expansion.



The discussion I have in mind was an informal discussion with members of the Appropriations Committee. At that time they felt that the amount of funds going into the training of service personnel was sufficiently small as compared to research personnel who were aimed at public service, that it would not be in the best interests of the program to put a limitation on it.

We have tried to recapture some of the discussions that we had at that time. We have not conducted further studies of this sort, but we will be compelled to during the coming year in response to requests by our Appropriations Committee. Actually there are two such requests, one will cover the special area of mental health. This will require the National Institute of Mental Health to consider the overall requirements for trained personnel in the service area, to discuss ways and means with the States for the sharing of the training responsibility and the effective utilization of these personnel, and to report back to the Congress prior to the appropriation hearings next spring for a general resolution of these problems identified.

Then we have a more general request by the Appropriations Committee to take a look at our total training activity, in all appropriations and all areas to develop more visualizable goals and objectives, so that the budget request as presented next year can be viewed as a step in the direction of some achievable goal or some goal that we visualize as desirable.

Mr. Chairman, the only thing that I could say now is that I will be glad to encompass certain elements of your question in the considerations that go into the development of the report, but I am sorry to say that I do not have any more thoughtful consideration that I could put before the committee today.

Mr. FOUNTAIN. We would like you to do so.

Dr. SHANNON. Yes, sir.

Mr. FOUNTAIN. We will look at recommendations 9 and 10.

***Recommendation No. 9—The Secretary of Health, Education, and Welfare carefully examine the existing programs and administrative arrangements for special-purpose training in the health field both in terms of overall Federal objectives in support of education and the impact of these programs on our educational institutions (p. 56)***

#### ***NIH action***

This recommendation is addressed to the Secretary. The NIH will be guided by action taken by that Office.

***Recommendation No. 10—The appropriate executive agencies and committees of the Congress give particular attention to the problem of attracting outstanding students to the field of medicine (p. 59)***

#### ***NIH action***

The scope of this recommendation exceeds existing NIH authority; however, it is believed that fellowships for medical students such as is provided for in legislation recommended by the administration and now before the Congress would substantially expand the opportunity for qualified youth to seek careers in medicine (H.R. 4999).

Mr. FOUNTAIN. Recommendation 9 is addressed to the Secretary of Health, Education, and Welfare, and recommendation 10, I believe, was discussed at some length yesterday in connection with the Surgeon General's testimony. Unless Dr. Goldberg or the subcommittee mem-

bers have further questions on these at this time, we will move on to the recommendations dealing with indirect costs.

Mr. GOLDBERG. No questions.

Mr. FOUNTAIN. Recommendation 11, then.

***Recommendation No. 11—Each participating institution be given the option of using either of two methods for computing the overhead allowance on supported research***

One method would be the continued use of a flat rate adjusted periodically to equal approximately 50 percent of the average rate of indirect expenses based on total direct costs for all grantee institutions as a group, as measured by appropriate cost-accounting principles and procedures. In lieu of the standard rate, and in order to provide equitable treatment for those institutions possessing relatively high overhead costs, an institution would be allowed 50 percent of its actual indirect cost rate determined in the same manner as above (p. 69).

***NIH action***

The problem of indirect cost has received a great deal of attention by the executive branch, the Congress, and the universities. The National Science Foundation is currently conducting a comprehensive study to determine more accurately the various components of indirect and direct cost. It is the view of the National Institutes of Health that substantial cost-sharing as recommended by the Fountain committee may seriously restrict the ability of topflight investigators and institutions to participate in NIH programs. Irrespective of philosophy, the decision rests with the Congress which has for 4 years restricted NIH to a 15-percent allowance for indirect costs notwithstanding the recommendation of the DHEW that this restriction be removed.

Mr. FOUNTAIN. Recommendation 11 is concerned with the general matter of an appropriate Government indirect cost policy. This is a matter, frankly, more appropriate for the President and the Congress, so we will not examine it beyond clarifying what this committee has recommended.

We have discovered that some people have misinterpreted our recommendation. I am inclined to disagree with your statement that the committee has recommended substantial cost-sharing. It was our view that a distinction could and should properly be made between sponsored and supported research, which we might also term directed and nondirected research, respectively.

The committee took the position that when a Federal agency makes financial aid available to help support research proposed by university scientists, and of a type customarily carried on by institutions of higher education, the Federal Government's financial participation in indirect costs associated with this research should be limited in general to the added burden resulting from the project.

When, on the other hand, a Federal agency seeks the performance of a specific project in accordance with the agency's specifications or under its direction, the Government, in the committee's opinion, has an obligation to pay all appropriate costs, both direct and indirect, related to the project.

To start with a cost-accounting instrument like Budget Bureau Circular A-21 and assume that payment of less than a rate determined under it amounts to substantial cost sharing is misleading. Circular A-21 is intended, as I understand it and as I think the committee understood it, to measure the full costs involved in performing sponsored or purchased research.

It was the committee's view that supported or nondirected research by its nature warrants a somewhat lower overhead payment. The same results could be obtained by tailoring a less inclusive version of Circular A-21 specifically for supported research.

Your summary is self-explanatory with respect to recommendations 12 and 13, recommendations with which NIH appears to be in complete agreement.

*Recommendation No. 12—No overhead be allowed on grants or grant items which do not entail actual indirect expenses, and an amount less than the regular rate be allowed when extramural research requires few institutional services (p. 69)*

*Recommendation No. 13—NIH reexamine its policy of making indirect cost payments on renovation and major equipment expenditures from grants for the establishment of clinical research facilities (p. 70)*

#### **NIH action**

The NIH concurs with the soundness of committee recommendations Nos. 12 and 13. In the past, NIH has not excluded specific direct cost items from the computation of overhead since the 15-percent rate has resulted in less than full indirect costs for essentially all grantee institutions. The recent growth of program and center projects has pointed up the need to single out these items for special attention. Accordingly, procedures have been revised to exclude indirect costs on items such as (1) alteration and renovation, (2) fixed equipment that becomes part of real property, (3) rental equipment, and (4) conferences and symposia. Previous procedure will be continued to exclude indirect costs on research bed costs and on any part of the cost of equipment in excess of \$2,500. Indirect costs will be negotiated on rentals and on such grants as those to medical schools in behalf of Veterans' Administration employees.

Mr. FOUNTAIN. I would like to ask that you give the subcommittee at this time some idea if you can of how fast you are moving toward implementing these new procedures, including the negotiation of indirect costs in situations such as the conduct of research in VA hospitals.

Dr. ALLEN. We have implemented all of those that are noted on the renewal application to which you referred earlier.

There is a new application form being developed for the new and competing renewal applications. The changed procedure will be incorporated in this application form also.

The one item on which there has been no announcement is the negotiation of indirect costs of research projects in VA hospitals.

For the VA hospital grants we will take them up individually as they come in, and negotiate an appropriate indirect cost rate.

The total announcement of charges will probably be part of a new information statement that will go out, hopefully, soon after the beginning of the year. Until that time we have to handle some of the changes individually.

Mr. FOUNTAIN. Do you have any questions in connection with that?

Mr. GOLDBERG. No. I think that explains pretty well, Mr. Chairman, how NIH is proceeding to implement that particular recommendation on indirect costs. Apparently they are moving to implement it.

Dr. ALLEN. We have actually really moved already on all except the VA, and will on that.

Even though we don't have the policy statement out on the new application form, we will adjust indirect costs in accordance with the revised policy described to you.

Mr. GOLDBERG. There is one question that occurs to me. In developing your forms and instructions, are you addressing yourself generally to research performed outside of the institution and in public facilities, or will they be restricted in their use to particular facilities, like VA hospitals?

Dr. ALLEN. In reference to indirect cost?

Mr. GOLDBERG. Yes.

Dr. ALLEN. In negotiation?

Mr. GOLDBERG. Yes.

Dr. ALLEN. Actually we have not addressed ourselves to that part of the question yet, but I am certain that we will consider any other institution in the same manner as the VA hospital if there is reason to negotiate indirect costs at a rate less than the 15 percent.

Mr. GOLDBERG. You will recall we talked a couple of years ago about the grant arrangement with Dr. Fazekas at District of Columbia General Hospital. That involved a situation similar to the VA's where grants were being administered through local medical schools for research in a municipal government hospital in which the taxpayers were already assuming the indirect costs associated with the research work.

Dr. ALLEN. We will treat such cases in the same manner. We will look at the total problem.

Mr. GOLDBERG. Fine.

Dr. ALLEN. But the only one that we have already taken action on—

Mr. GOLDBERG. I think that clarifies it.

Dr. SHANNON. I was at one such institution during part of World War II, and I was running malaria research done by the Office of Scientific Research and Development, Department of the Army, at a New York City hospital called the Goldwater Memorial Hospital, and our problem there was the university work was at a municipal hospital and there was quite a negotiation there on sharing of costs. So I think we are aware of this.

The thing I would point out, that at times the clinical facilities used may be such a small part of a total research activity that until such a time as one attempts to pay so-called full-added costs, the payment of 15 percent to the institution that is sponsoring the research still may well be the most equitable way of handling that.

Mr. GOLDBERG. This assumes the payment of 15 percent for a given institution is less than the indirect cost rate to which it is justly entitled.

Dr. SHANNON. That is correct. I have also instances of that sort with the university relationship to Goldwater. We studied patients at Bellevue Hospital. The major portion of the research costs occurred in the university department of physiology, although a good deal of the manual work was done in the wards at Bellevue Hospital.

So I think we have these two situations that will require quite frankly independent grant-by-grant consideration.

Mr. GOLDBERG. There are probably three distinct categories related to the determination of proper indirect cost rates. First there is the performance of research which is completely in-house; second, there is the performance of research which is being done exclusively outside the institution; and a third situation would be a combination of these two, which probably is the case in a portion of the grants that are



being used in VA hospitals through medical schools. I am sure that some of these are of a true collaborative nature, but others are not.

Mr. ALLEN. This is why we prefer to negotiate instead of just ruling out VA indirect costs.

Mr. FOUNTAIN. Dr. Shannon, yesterday you expressed the feeling that there should now be a moratorium of at least a year in the expansion of training programs to permit the schools to adjust, and to give NIH an opportunity to reexamine its policies and plan for the future.

What is your judgment as to a proper rate of growth for the extramural research program?

Dr. SHANNON. I would be in a better position to estimate that in the spring after we have completed studies that are already underway.

The reason I say that is that the thing that we will have to study before we make a beginning in this direction is the extent to which there is a variability in the growth curve by virtue of our training people at a higher rate than are retiring from the field.

The second thing is a study of the extent to which we are doing adequate training in the critical areas as opposed to an imbalance, too much training in one area and not enough in another, in terms of what the community would wish to place its bets on in the way of future research efforts.

But quite apart from those considerations that we can handle internally and can handle in a reasonably precise way, there is the basic problem of national intent. And, Mr. Chairman, I think that this is something that has its parallel, I suppose, in the civilian control of the Army. There should be civilian control of science, or, shall we say, nonprofessional control of science. In the competing needs of various sectors of our economy for support, nobody in any given sector can approach this problem in a wholly objective way, and there has to be the generalist who sits at the top and makes certain general decisions. This function the Congress performs in conjunction with the executive branch.

I could give you an estimate of how rapidly it can grow with vigor, and what are the likely consequences of one rate of growth as opposed to another, what is the rate of acquisition of new knowledge, what are the chances that this new knowledge will be acquired at a rapid rate.

These are the questions that I think I am in a reasonably good position to make crude estimates on. And I emphasize "estimates" rather than "determinations."

But when it comes to determining from the point of view of a professional what is the optimal rate of growth, I am afraid I am in a position there where I am no longer an objective observer but rather a special pleader. This has some hazards. In the one case, realizing you are a special pleader, you may be overconservative. Not realizing you are a special pleader, you may be overenthusiastic.

Now, quite frankly, I think overconservatism has characterized my attitude toward training programs this past year because, while I testified before the House and the Senate that I would like no increase in appropriations during the current year, it turned out a month or 6 weeks after this testimony that by general agreement

the stipend for our training of fellows, in order to retain competitiveness, had to be increased in order to maintain the same level of program.

In this statement here I am not talking about dollars, I am talking about the program level. Had I the opportunity to retestify to the House and the Senate Appropriations Committees, I would request an increase in funds to accommodate the increase in cost of doing business, but not request an expansion of the program.

The situation we find ourselves in now—and fortunately the Senate fully appreciated our position, and while on the one hand they accepted the estimates of their outside advisers as opposed to ours as to what could be done in training, they pointed out that we did have the better part of a year to finish the preliminaries of the studies I have alluded to prior to making grants, because in the training program we make grants for 1 year for expenditure the following year, and at the present time we are giving instructions to our institutes not to make new grants or implement new grants until our preliminary studies have been completed.

So that I think the general question that we pose is the level of training, the general question we pose as to an optimal level—

Mr. FOUNTAIN. A proper rate of growth.

Dr. SHANNON. I would try to estimate that later in the year if it is possible. And at such time as we do this, we would be glad to so inform you by special memorandum.

But apart from that, it is already apparent in our studies that there are certain areas that are grossly deficient in support. And the question now is, should extension of training into those areas be accompanied by diminished training in other areas, or should this new training area be added?

This is one of the problems we will address ourselves to this fall.

But I would like to be able to inform you later on in the year, if I could.

Mr. FOUNTAIN. I asked the question because appendix table 3 in our committee report shows how rapidly your extramural programs have expanded.

For example, NIH expenditures for extramural research and training increased from \$23.5 million in 1950 to \$301.4 million in 1960, and the 1961 appropriation for these purposes was \$447.5 million.

For research grants alone your appropriation has grown from \$14.1 million in 1950 to \$293.9 million in 1961, more than a twenty-fold increase.

Frankly, I was astonished at the huge increase in research funds recommended by the Senate Appropriations Committee. In fact, many members were reluctant to support on the floor of the House a much smaller increase recommended by the House committee. But they went along because of the difficulty of forming a personal judgment in this area.

Dr. SHANNON. I would only comment on one aspect of this, Mr. Chairman. As we view the development of our programs, we would say that these took place under three quite different circumstances. There was the immediate postwar period, it was concerned with picking up the support of ongoing research for which there were no funds to continue—in other words, this was to avoid discontinuing

the work started during the war years. I would say that would characterize our progress for the better part of 1946 to 1950.

Beginning in 1950 one addressed oneself to the role of a support agency in the medical field at a time when, due to income tax laws, due to an increase in living costs, and the like, the resources of institutions were progressively drying up, and funds were being required for mandatory operating expenses as opposed to the research add-on, and a new grant-in-aid program was then the kind required to expand in a modest way the research programs of the Nation.

After a 5-year period of such modest grant-in-aid activity and beginning in 1956, there was a reentry into what has become the formal Federal role in medical research. This action of the executive branch and the Congress in 1956 and 1957 was based on the considerations that the health of the Nation was one of our greatest Federal responsibilities; that the salvaging of an unsatisfactory health situation could only be with the acquisition of new information; it was to the best interest of the Nation not only to satisfy the requirements of the opportunities of research work which were already in the field, but to establish the means for expansion and recruitment of the medical research base in manpower and facilities.

In response to this type of consideration, there was established the research and construction facilities program in 1956. Mr. Eisenhower's Secretary of HEW, Mr. Folsom, requested for us an unheard-of 30-percent increase in budget. This was for 1957. This was increased by both the House and the Senate. And in the reports of the House and the Senate for the fiscal year of 1957 and the fiscal year of 1958, we find this, together with the opening statements of our Secretary, that the need for new knowledge was so great in areas of the dread diseases or areas of the disabling diseases that the acquisition of new knowledge should not be curtailed drastically by the simple lack of funds, but that the upper limitation on research efforts should be the scientific capabilities of our scientists, and where these were inadequate, training programs should be substantially increased.

So if you look back to the breakpoint at 1957, where, as a matter of policy, both the legislative and the executive branches desired to expand as rapidly as possible both the support of science and the development of new scientists, I think you should look at the budget in that light rather than the situation that obtained in 1950.

Now, I have told our Secretary that in my best judgment we have come to a point where it is highly advisable to develop some ways and means of planning for a 5-year segment instead of for an annual period. I have told Mr. Ribicoff that I felt that this can't be done wholly by the executive branch, that this should be done in association with selected Members of the Congress.

By this means there can be developed a total program which will find support in the executive branch and find satisfaction in the legislative branch that will give us the time to address ourselves to the very serious problems that we face; that will give adequate time for developing new programs; that will not in any sense relieve the pressure—we are not asking for relief of pressure, we feel that the more pressure we can take, probably the better we will function, but there is no substitute for planning time in the evolution of the program of this general sort. We don't feel that this is possible, short of the capability of planning for more than a single year.

The Senate is considering our annual appropriation now. It will then have to come to conference and subsequently to the two Houses. This will take a week or 2 or 3. Then it will go to the Bureau of the Budget for reapportionment. So we won't have an opportunity to plan our work until some time in mid-September, and we will have lost the bulk of a quarter of a year.

This, I think, is an unhealthy operational situation to find ourselves in.

So I have great hopes that the Secretary may be able to develop the type of joint legislative-executive planning session that we have in mind, and I think that this probably could be the most important single thing that happened in the research area, if it does, in fact, come to pass.

Dr. ALLEN. We will have lost two out of three council meetings, making the situation even more critical.

Mr. FOUNTAIN. I would certainly think so. I noticed with interest that the 1961 appropriations for the National Institutes of Health totaled \$558,177,300, and the 1962 budget estimate of the need is \$583 million. At that point, did the Budget Bureau cut—

Dr. SHANNON. Yes; that was not our proposal, sir.

Mr. FOUNTAIN. Do you recall what your proposal was?

Dr. SHANNON. We proposed \$656 million.

Mr. FOUNTAIN. Then the House allowed \$641 million.

Dr. SHANNON. Yes.

Mr. FOUNTAIN. Which was a little under what you, yourself—

Dr. SHANNON. When you correct for the overhead item, it was very close to what we proposed.

Mr. FOUNTAIN. But I see the Senate committee has jumped it to \$835,670,000. I am always curious to know what information a committee like that has which prompts it to make that kind of jump so far above what you, yourself, requested. And as you intimated, when we are interested in a program and/or in charge of it, most of us ask for what we think we need, and sometimes a little more, in the hope that we will get what we need.

Dr. SHANNON. Well, sir, I think that our attitude is perhaps the opposite. I am overconservative in my estimates. And my Institutes directors asked me to propose for them considerably more than the \$656 that I submitted to the Public Health Service. I don't think there is anything wrong with being conservative in my testimony.

Mr. FOUNTAIN. I agree with you on that.

Dr. SHANNON. But whether rightfully or wrongfully, the Senate figure is based upon an all-out effort where the capabilities of the Nation as interpreted to them by diverse outside advisers who are not conservative—in other words, they are looking to a saturation program. My best judgment is that a saturation program in any one year is less advisable than a predictable plan of vigorously growing. And I think you are facing here two different philosophies where my friends on the outside would agree with my own estimate of being conservative.

Mr. FOUNTAIN. Dr. Goldberg?

Mr. GOLDBERG. In formulating your budget request, Dr. Shannon, did you have access to advice and information from many of the same outside witnesses who appeared before the Senate subcommittee?

Dr. SHANNON. Yes.



Mr. GOLDBERG. I am under the impression that many of these people serve on your advisory bodies.

Dr. SHANNON. Yes.

Mr. GOLDBERG. In a sense, then, the differing estimates of NIH's requirements are the result of different judgments by the several groups based upon very much the same scientific evidence and professional opinion.

Dr. SHANNON. I think there also is a somewhat different philosophy. I have never made a request that I expected to be cut; in other words, in any request I make there is no fat, "Drop back here and we will be happy," that is not the way I operate my office.

On the other hand, I am perfectly sure that some of our outside advisers do operate on the concept that if you want to get that you have to ask for this.

Now, basically this is the philosophy that obtains in the business world, this is in a sense the pattern of American bargaining, if you will. There is nothing wrong with it. It is just that I don't operate that way.

Mr. FOUNTAIN. Even between the House and the Senate they will do that. The House says, "The Senate is going to do so-and-so, so we will make it a little lower and have something to compromise on."

Dr. SHANNON. So I think that in very good faith these outside witnesses can defend in a very adequate way that which they propose.

Now, the other thing is—and I think we are perhaps in the best position of viewing this—there is a certain conflict in demand on short personnel when two people want to push the same type of program. I think this enters more into our calculations—in other words, the feasibility of mounting a program will loom very large in our computations. On the other hand, I think the desirability will loom very large in the calculations of an outside consultant.

The thing I am trying to say is that these very, very well-meaning people, they are very sophisticated individuals, they know the field, they know the opportunities, but I don't think that they are in a position to realize the competition amongst programs. The Senate fully realized this, because this year it cut about \$100 million off of what their advisers had proposed, based largely on our discussion of some of the shortages—at least based in part, I should say, on an appreciation of competition for short skills.

I might say, too, realizing the short skills, this is why the Senate said that I was shortsighted in not placing more emphasis on an expansion of the training program, because if short skills were holding the program back, then why did we not point this out as a need. But, Mr. Fountain, there are many ways you can look at these budgets. And we try in the first place to give a conservative estimate of what will be a good, very vigorous program.

On the other hand, if we are given more by the Congress, we will try to carry out their wishes. We will not spend the money if it cannot be effectively spent, and we have turned back balances of a substantial amount every year for the last 4 or 5 years. And I might say this is one of the reasons why on the Senate side that they give us a little too much, they are not concerned, because they know we won't spend it.

Mr. FOUNTAIN. Do you have any figures indicating what you may have turned back in each of the last 4 or 5 years?

Mr. MURTAUGH. If I am not mistaken, a comparison of the two tables in the record will give it. You do have obligations and appropriations showing the difference.

Mr. GOLDBERG. It can also be found in appendix table 2 in the committee report which shows the reconciliation between appropriations and expenditures for each fiscal year since 1950.

Dr. SHANNON. In one year, 1957, we turned back \$15 million; in 1959, \$9 million; and in 1960, \$9,600,000. These are substantial amounts. It is quite clear that we can't be party to spending simply to spend. So the fact that we may not ask for as much as is given in no way affects our judgment. We try to bring to bear the guidelines which we accept from the Congress.

Mr. FOUNTAIN. I think the action of the Congress year in and year out has reflected credit upon you and confidence in the way you have handled the situation, the fact that you have turned money back. The Appropriations Committee has prompted both bodies at times to go beyond the Budget figure with the expectation that you wouldn't spend the entire amount if it weren't necessary.

What concerns me is that the pressures may now be so great sometimes from the Congress itself that an agency may embark upon programs where the money is not wisely spent. It seems to me that there is a point of diminishing returns somewhere; if you go too fast you can spend more money than can be spent wisely and intelligently.

Dr. SHANNON. We had a very good example of that this year. We had a program—one of the biggest needs at the present time in our programs is for the establishment of careers in science. Stable careers have not increased in proportion to the funds expended. Unless there are careers you can't attract the top people. And in response to this need Congress set aside \$2 million to start a program that would support research professorships within our universities. We did staff work on the program during the course of the year, but we felt that by May we did not have a program that we were sufficiently satisfied with to move forward, and we returned the dollars, and we returned the applications, and we revised the programs. This year we will come up with a good program.

Now, obviously we are subject to criticism from disappointed people, but heartened by the conviction that the program that gets underway now will truly satisfy the need, is all we need for moral support for what we have done. And I hope we continue to be able to—

Mr. FOUNTAIN. Dr. Shannon, reflecting back upon a question I asked a moment ago, I am not sure you understood it or that I understood your answer.

I asked you your judgment as to the proper rate of growth for the extramural research program. I think you dealt primarily with training programs.

Dr. SHANNON. I think, sir, this is part of it, because the training program in part will determine the growth. These are interacting variables, if you will. I would say, to give you a figure as I see the thing, it certainly should be in excess of 10 percent a year, as estimated, but whether over and above that it should be another 10 percent or another 20 percent I would not be in a position to judge, sir.

Mr. FOUNTAIN. Gentleman, we have a rollcall on an important piece of legislation, and we will have to go. I have a few remaining questions which I will ask Dr. Goldberg to give you, and if you will, you can simply answer those for the record. It won't take too much time.

(The additional questions presented to Dr. Shannon and his written responses follow:)

Question: Some of us in the Congress are concerned by the tendency in the past few years to use NIH research grant money for the construction of facilities at private institutions on a nonmatching basis. I believe this has been done under the authority of section 433a of the basic Public Health Service Act. It seems to me that this practice of making construction grants without requiring any financial participation by the grantees is a dangerous one, except under very unusual circumstances.

It also departs from orderly processes and introduces a kind of "unfair competition" with the regular health research facilities program which Congress has established on a financial matching basis.

Would you care to comment on this matter?

Dr. Shannon's reply: Mr. Chairman, I would be glad to comment on this problem. As you pointed out, we are operating at the present time two parallel programs of grants for research facilities construction. The program authorized by title VII of the Public Health Service Act requires that the institution receiving the grant pay at least 50 percent of the costs of construction of the research facility. We are also making certain grants under section 433a of the Public Health Service Act which do not require the provision of any matching funds by the recipient institution. These nonmatching construction grants have been specifically authorized by the Congress in its action on appropriations for NIH.

The existence of these parallel programs with different matching requirements and based on separate authorities creates considerable administrative difficulties. Title VII provides, in addition to the matching requirement, a systematic and consistent basis for the review of applications and the administration of the grant program including a special advisory council, certain requirements for the approval of applications, some basis for determining priorities, and other provisions for an orderly administration of the program. Section 433a contains none of these provisions. It is very difficult, therefore, to work out an equitable and consistent relationship between programs which have such differences in matching requirements and administrative provisions.

I believe that a good step toward the alleviation of these problems would be the passage by the Congress of a construction program such as that proposed by the administration and presently before the Congress. In addition to an extension and expansion of the title VII program, the proposal contains a provision for construction of facilities which would serve a regional or national purposes beyond the needs of an individual institution. These facilities could be constructed by the Federal Government without matching funds from the individual institution. The administration proposal would provide a more logical basis for our construction programs than the present parallel authorities.

Question: The NIH appropriation for fiscal 1961 contained a \$5 million amount for cancer facility grants without matching requirements. It has been brought to our attention that a single institution received most of this construction money. Would you explain the criteria used by NIH in determining which institutions should receive this \$5 million. To what extent was financial need a factor in this determination?

Dr. Shannon's reply: This \$5 million amount was added to the 1961 appropriation for the National Cancer Institute to be used for nonmatching research facility construction grants under the authority of section 433a. The criteria for reviewing applications were developed in consultation with the National Advisory Cancer Council and included (1) an established cancer research program of demonstrated excellence in research areas of importance, (2) evidence that construction was clearly needed for more effective utilization of the research staff, (3) evidence that all reasonable efforts to raise funds elsewhere had been made without success, and (4) evidence that the cost is reasonable. A

press release was issued in mid-October inviting applications by January 15, 1961.

Thirty-three applications, requesting a total of \$28,982,816, were received. A site visit was made at each applicant institution by members of the National Advisory Cancer Council, the staff of the National Cancer Institute, and by consultants. At a special meeting of the National Advisory Cancer Council on April 29-30, the applications were reviewed in the light of the above criteria. Seventeen applications were found to satisfy the criteria and were recommended by the Council and were placed on a priority list according to merit. The grants were awarded in accordance with the Council's priority rating insofar as funds permitted. Seven grants, totaling \$5 million, were awarded to six institutions. Ten applications for an additional \$6,201,079 were recommended by the Council but well below the priority cutoff line.

Question: Who will provide the operating funds for these facilities built with NIH grants?

Dr. Shannon's reply: The responsibility for providing operating funds for these facilities rests with the grantee institutions. In part, the funds will doubtless be derived from revenues of the universities, including State appropriations, income from endowment, tuition, and fees. The remainder will be obtained in the form of gifts, grants, and contracts for research, including grants from NCI, although the proportion obtained from NCI grants will vary from institution to institution from time to time. It would probably be safe to estimate that approximately 50 percent of the operating funds would be obtained in the form of research grants from the National Cancer Institute.

Question: Dr. Shannon, you discussed in your statement yesterday some of the problems and objectives connected with your development of an adequate system of statistical reporting and analysis for the NIH programs. Can you give us some details on the nature of the organizational or other changes you contemplate and how soon you expect this statistical system to be fully operative?

Dr. Shannon's reply: Mr. Chairman, in the first place I should like to emphasize that we do have in operation a statistical system which is providing essential data covering the operations of the extramural program. This system, as I mentioned in my opening statement, includes not only the activities of the Statistics and Analysis Branch in the Division of Research Grants but other components as well. These components include the functions of the Office of Program Planning within my immediate Office and notably the Resources Analysis Section of that Office which is concerned with the measurement and analysis of the total national effort in the field of medical research—specifically research expenditures, research manpower, and needs for research facilities. In addition, each of the Institutes have program analysis components directed toward the provision of statistical data relevant to their individual programs. This system is operational as of the present moment.

My reference in my opening statement was to our desire to improve and enlarge these statistical-analytical activities in a manner commensurate with the magnitude and significance of the programs which we now have underway. Therefore, we are at the present moment giving special attention to the question of whether the organizational framework under which these activities are now carried out will permit the fullest realization of our needs in this area. It is early to say whether we will conclude that major changes are necessary. I should be glad, however, to communicate to the committee at the conclusion of this examination the report of the findings.

Mr. FOUNTAIN. Thank you very much for coming up. It has been a very educational meeting to me, and I am sure to the others who have had an opportunity to sit in.

Dr. SHANNON. Thank you very much.

Mr. FOUNTAIN. The subcommittee stands in recess until the further call of the Chair.

(Whereupon, at 2:25 p.m., the subcommittee adjourned, subject to the call of the Chair.)



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